

10/714,394-267960-EIC 1700 SEARCH

STRUCTURE SEARCH

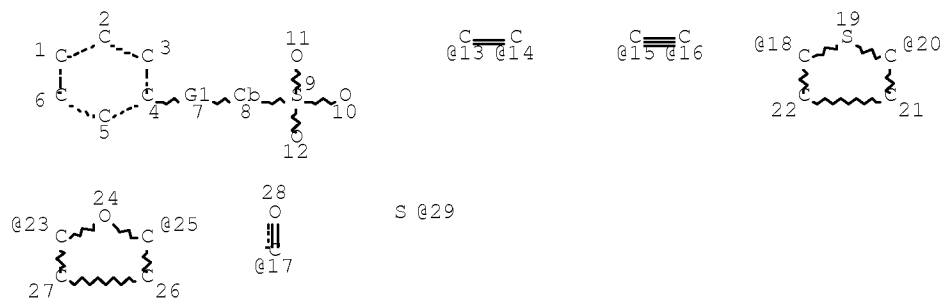
=> d his 151

(FILE 'HCAPLUS' ENTERED AT 10:53:54 ON 13 AUG 2008)

L51 18 S L49 AND L50
SAV TEMP L51 WEI394HCP/A

=> d que 151

L6 STR



VAR G1=O/S/13-4 14-8/15-4 16-8/23-4 25-8/18-4 20-8/17/29

NODE ATTRIBUTES:

CONNECT IS E1 RC AT 11
CONNECT IS E1 RC AT 12
CONNECT IS E1 RC AT 28
CONNECT IS E2 RC AT 29
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 8
DEFAULT ECLEVEL IS LIMITED
ECOUNT IS E6 C AT 8

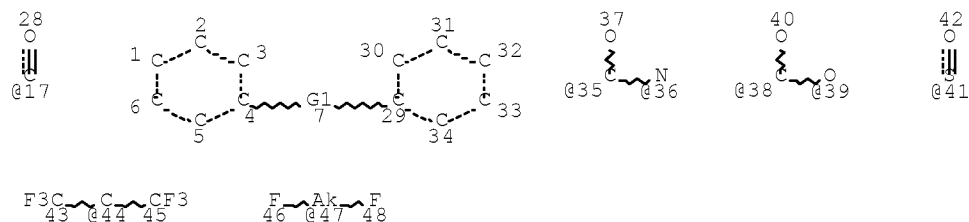
GRAPH ATTRIBUTES:

RSPEC I
NUMBER OF NODES IS 29

STEREO ATTRIBUTES: NONE

L8 16298 SEA FILE=REGISTRY SSS FUL L6

L11 STR



VAR G1=17/41/SO2/35-4 36-29/38-4 39-29/44/47

NODE ATTRIBUTES:

CONNECT IS E1 RC AT 28
CONNECT IS E1 RC AT 37
CONNECT IS E1 RC AT 40
CONNECT IS E1 RC AT 42
DEFAULT MLEVEL IS ATOM
GGCAT IS SAT AT 47
DEFAULT ECLEVEL IS LIMITED
ECOUNT IS M1-X10 C AT 47

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GRAPH ATTRIBUTES:

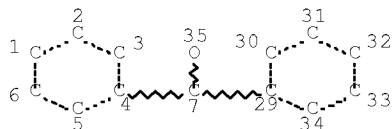
RSPEC I

NUMBER OF NODES IS 29

STEREO ATTRIBUTES: NONE

L13 3230 SEA FILE=REGISTRY SUB=L8 SSS FUL L11

L15 STR



NODE ATTRIBUTES:

CONNECT IS E1 RC AT 35

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

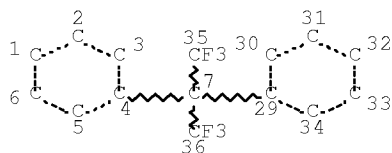
GRAPH ATTRIBUTES:

RSPEC I

NUMBER OF NODES IS 14

STEREO ATTRIBUTES: NONE

L16 STR



NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RSPEC I

NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

L18 153 SEA FILE=REGISTRY SUB=L8 SSS FUL L15 AND L16

L20 157 SEA FILE=HCAPLUS ABB=ON PLU=ON L18

L22 2828 SEA FILE=HCAPLUS ABB=ON PLU=ON L13

L26 174487 SEA FILE=HCAPLUS ABB=ON PLU=ON "FUEL CELLS"+MAX/CT

L27 89664 SEA FILE=HCAPLUS ABB=ON PLU=ON FUEL(2A) CELL?

L28 197224 SEA FILE=HCAPLUS ABB=ON PLU=ON L26 OR L27

L29 127 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 AND L28

L30 565 SEA FILE=HCAPLUS ABB=ON PLU=ON L22 AND L28

L31 565 SEA FILE=HCAPLUS ABB=ON PLU=ON L29 OR L30

L32 31323 SEA FILE=HCAPLUS ABB=ON PLU=ON ?POLYM?(3A)ELECTROLYT?

L33 331 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 AND L32

L34 QUE ABB=ON PLU=ON MEMBRANE

L35 297 SEA FILE=HCAPLUS ABB=ON PLU=ON L33 AND L34

L36 54625 SEA FILE=HCAPLUS ABB=ON PLU=ON ION?(2A) CONDUCT?

L37 131 SEA FILE=HCAPLUS ABB=ON PLU=ON L35 AND L36

L38 267283 SEA FILE=HCAPLUS ABB=ON PLU=ON IONOMERS+MAX/CT

L39 257 SEA FILE=HCAPLUS ABB=ON PLU=ON L35 AND L38

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L40 275 SEA FILE=HCAPLUS ABB=ON PLU=ON L37 OR L39
 L41 QUE ABB=ON PLU=ON CATALYST?
 L42 QUE ABB=ON PLU=ON CATALYSTS+MAX/CT
 L43 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7440-44-0/RN
 L44 QUE ABB=ON PLU=ON L43 OR CARBON
 L45 44912 SEA FILE=HCAPLUS ABB=ON PLU=ON L44(3A)L41
 L46 36069 SEA FILE=HCAPLUS ABB=ON PLU=ON L44(L)L42
 L47 21 SEA FILE=HCAPLUS ABB=ON PLU=ON L40 AND (L45 OR L46)
 L48 QUE ABB=ON PLU=ON ELECTROD? OR CATHOD? OR ANOD? OR (
 NEGATIVE OR POSITIVE) (2A)ELECTROD?
 L49 20 SEA FILE=HCAPLUS ABB=ON PLU=ON L47 AND L48
 L50 QUE ABB=ON PLU=ON FILM? OR THINFILM? OR LAYER? OR OV
 ERLAY? OR OVERLAID? OR LAMIN? OR LAMEL? OR MULTILAYER?
 OR SHEET? OR LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR OVE
 RCOAT? OR VENEER? OR SHEATH? OR COVER? OR ENVELOP? OR E
 NCASE? OR ENWRAP? OR OVERSPREAD? OR ENCAPSUL?
 L51 18 SEA FILE=HCAPLUS ABB=ON PLU=ON L49 AND L50

STRUCTURE SEARCH RESULTS

=> d 151 1-18 ibib ed abs hitstr hitind

L51 ANSWER 1 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2008:859827 HCAPLUS Full-text
 DOCUMENT NUMBER: 149:157223
 TITLE: Polymer electrolyte
 membrane/catalyst assembly (MEA), its
 manufacture, and its hydrogen-fueled
 polymer electrolyte
 fuel cells
 INVENTOR(S): Kitamura, Kota; Sakaguchi, Yoshimitsu;
 Yamaguchi, Hiroki; Yamashita, Masahiro;
 Yamada, Takatoshi; Takase, Satoshi; Miyagawa,
 Shinji
 PATENT ASSIGNEE(S): Toyobo Co., Ltd., Japan; Nissan Motor Co.,
 Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
JP 2008166050	A	20080717	JP 2006-352397	2006 1227
PRIORITY APPLN. INFO.:			JP 2006-352397	2006 1227

ED Entered STN: 18 Jul 2008
 GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT
 *

AB The MEA contains a polymer electrolyte membrane comprising (1) a polymer represented by the general formula I [$n_1, n_2, m_1-m_3 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$, $m_3/(m_1 + m_2 + m_3) = 0.005-0.05$, and $m_2/(m_1 + m_2 + m_3) = 0.01-0.20$] and (2) 5-15% of a polymer II [$n_3 = \geq 1$ -integer; $m_4, m_5 = \geq 1$ -integer satisfying $m_5/(m_4 + m_5) = 0.60-0.80$] and an electrode catalyst layer which is bonded directly at least on one side of the polymer electrolyte membrane, where the surface roughness of the membrane/catalyst interface is $\leq 1 \mu\text{m}$. The MEA is prepared by direct application of a catalyst slurry containing an electrode catalyst, a polymer electrolyte and a solvent at least on one side of the polymer electrolyte membrane containing the polymer I and 5-15% of the polymer II in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$. The hydrogen-fueled polymer electrolyte fuel cell shows high output performance even in low moisturizing condition and also shows excellent durability.

IT 1027300-88-4P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (manufacture of polymer electrolyte
 membrane/electrode assembly for
 hydrogen-fueled polymer electrolyte
 fuel cells)

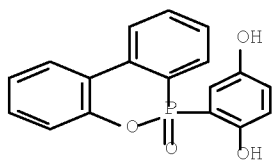
RN 1027300-88-4 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt
 (1:2), polymer with 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-

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dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and
4,4'-thiobis[phenol] (CA INDEX NAME)

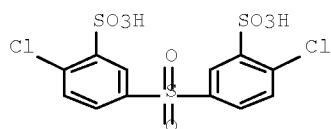
CM 1

CRN 99208-50-1
CMF C18 H13 O4 P



CM 2

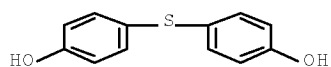
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

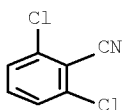
CM 3

CRN 2664-63-3
CMF C12 H10 O2 S



CM 4

CRN 1194-65-6
CMF C7 H3 Cl2 N



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST hydrogen fueled polymer electrolyte
fuel cell; polymer electrolyte
membrane electrode assembly

IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Vulcan XC 72R, gas diffusion layer; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Polyoxyalkylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

IT Polysulfones, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polybenzimidazole-; manufacture of polymer
electrolyte membrane/electrode
assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Polythioethers
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-polyoxyarylene-polysulfone-, cyano-containing; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Polysulfones, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-polyoxyarylene-polythioether-, cyano-containing; manufacture
of polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Polyoxyarylenes
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-polysulfone-polythioether-, cyano-containing; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Fuel cells
(polymer electrolyte; polymer
electrolyte membrane/electrode
assembly (MEA), its manufacture, and its hydrogen-fueled
polymer electrolyte fuel
cells)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, Nafion; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Ionomers
RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and

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sulfo-containing, Nafion; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyoxyarylene-polysulfone-polythioether-, cyano-containing;
manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

IT Polybenzimidazoles

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polysulfone-; manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

IT 9002-84-0, Polyflon D 1E

RL: TEM (Technical or engineered material use); USES (Uses)
(carbon paper waterproofed with; manufacture of polymer
electrolyte membrane/electrode
assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT 354114-33-3, TGP-H 060

RL: TEM (Technical or engineered material use); USES (Uses)
(gas diffusion layer; manufacture of polymer
electrolyte membrane/electrode
assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT 861709-53-7P, 2,5-Dicarboxybenzenesulfonic acid monosodium
salt-3,5-dicarboxyphenylphosphonic acid-3,3',4,4'-
tetraaminodiphenylsulfone copolymer
1027300-88-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)
(platinum/carbon electrode catalyst
layer; manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

L51 ANSWER 2 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:859826 HCAPLUS Full-text

TITLE: Polymer electrolyte
membrane/catalyst assembly, its
manufacture, and hydrogen-fueled fuel
cell

INVENTOR(S): Yamashita, Masahiro; Kitamura, Kota;
Yamaguchi, Hiroki; Yamada, Takatoshi; Shimizu,
Yusuke; Miyagawa, Shinji

PATENT ASSIGNEE(S): Toyobo Co., Ltd., Japan; Nissan Motor Co.,
Ltd.

SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

10/714,394-267960-EIC 1700 SEARCH

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008166049	A	20080717	JP 2006-352389	2006 1227

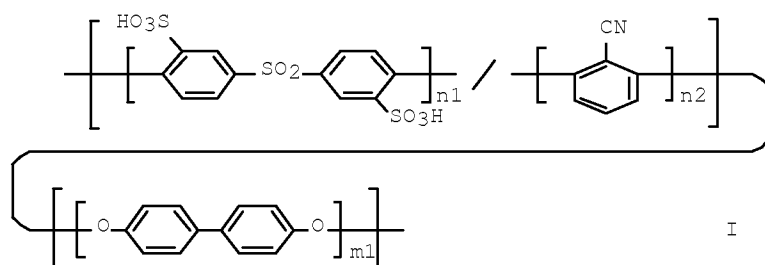
PRIORITY APPLN. INFO.:

JP 2006-352389

2006
1227

ED Entered STN: 18 Jul 2008

GI



AB The polymer electrolyte membrane /catalyst assembly contains (1) a polymer electrolyte membrane which contains a polymer I ($n_1, n_2 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$; $m_1 = \geq 1$ -integer) and shows coefficient of linear expansion at $150-200^\circ$ (TGA, in N₂, 30-min dry at 25° followed by heating at $5^\circ/\text{min}$ to 350°) in a predetd. range and (2) an electrode catalyst layer which is bonded directly on at least one side of the polymer electrolyte membrane and has been formed by direct application of a catalyst slurry containing Pt/C powder, ionomers, and solvent in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$.

IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer

RL: IMF (Industrial manufacture); POF (Polymer in formulation);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)

(polymer electrolyte membrane/
electrode assembly (MEA), its manufacture, and its
hydrogen-fueled polymer electrolyte
fuel cells)

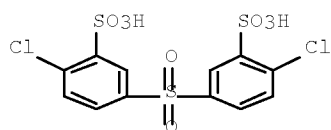
RN 681035-31-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt
(1:2), polymer with [1,1'-biphenyl]-4,4'-diol and
2,6-dichlorobenzonitrile (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

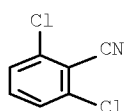


●2 Na

CM 2

CRN 1194-65-6

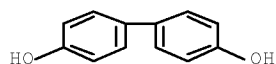
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

CMF C12 H10 O2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST polyarylene ether hydrogen fueled fuel cell;
polymer electrolyte membrane catalyst
assembly

IT Carbon black
RL: TEM (Technical or engineered material use); USES (Uses)
(Vulcan XC 72R, gas diffusion layer; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Polyoxyalkylenes
RL: TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)

IT Fluoropolymers
RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

IT Fuel cells
(polymer electrolyte; polymer
electrolyte membrane/electrode

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assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

IT Fluoropolymers

RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, Nafion; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Ionomers

RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, Nafion; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Polysulfones

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyoxyphenylene-, oxynitrile-, sulfonic acid group-containing; polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

IT Polyoxyphenylenes

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polysulfone-, oxynitrile-, sulfonic acid group-containing; polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

IT 7440-06-4, Platinum 7440-44-0, Carbon

RL: CAT (Catalyst use); USES (Uses)
(Pt/carbon electrode catalyst layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 9002-84-0, Polyflon D 1E

RL: TEM (Technical or engineered material use); USES (Uses)
(carbon paper water-proofed with; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 354114-33-3, TGP-H 060

RL: TEM (Technical or engineered material use); USES (Uses)
(gas diffusion layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt copolymer

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

L51 ANSWER 3 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2008:859823 HCAPLUS Full-text
TITLE: Polymer electrolyte

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membrane/catalyst assembly, its
manufacture, and hydrogen-fueled fuel
cell

INVENTOR(S): Sakaguchi, Yoshimitsu; Kitamura, Kota;
Yamaguchi, Hiroki; Yamashita, Masahiro;
Yamada, Takatoshi; Takase, Satoshi; Miyagawa,
Shinji

PATENT ASSIGNEE(S): Toyobo Co., Ltd., Japan; Nissan Motor Co.,
Ltd.

SOURCE: Jpn. Kokai Tokkyo Koho, 15pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

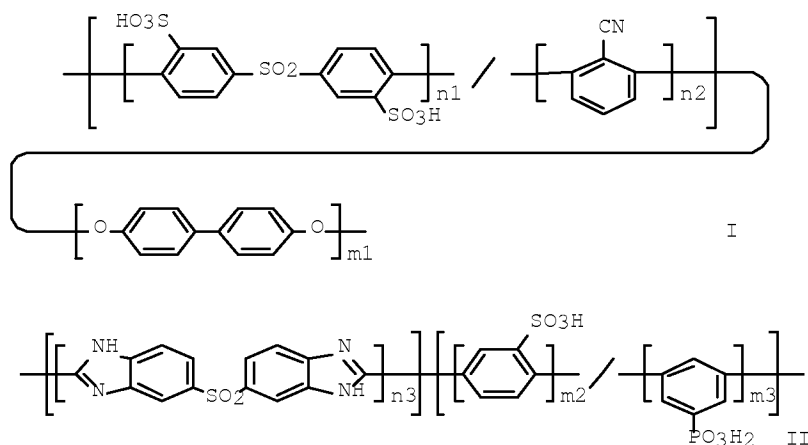
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008166037	A	20080717	JP 2006-352154	2006 1227
PRIORITY APPLN. INFO.:			JP 2006-352154	2006 1227

ED Entered STN: 18 Jul 2008
GI



AB The polymer electrolyte membrane /catalyst assembly contains (1) a polymer electrolyte membrane which is composed of 85-95% of a polymer I ($n_1, n_2 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$; $m_1 = \geq 1$ -integer) and 5-15% of a polymer II ($n_3 = \geq 1$ -integer; $m_2, m_3 = \geq 1$ integer satisfying $m_3/(m_2 + m_3) = 0.60-0.80$) and (2) an electrode catalyst layer which is bonded directly on at least one side of the polymer electrolyte membrane and has been formed by direct application of a catalyst slurry containing electrode catalysts, polymer electrolytes, and solvents in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$.

IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-disulfo-4,4'-dichlorodiphenylsulfone disodium salt

10/714,394-267960-EIC 1700 SEARCH

copolymer

RL: IMF (Industrial manufacture); POF (Polymer in formulation);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)

(polymer electrolyte membrane/
electrode assembly (MEA), its manufacture, and its
hydrogen-fueled polymer electrolyte
fuel cells)

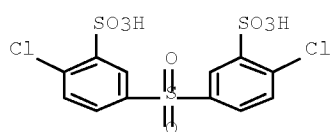
RN 681035-31-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt
(1:2), polymer with [1,1'-biphenyl]-4,4'-diol and
2,6-dichlorobenzonitrile (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

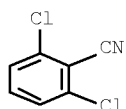


●2 Na

CM 2

CRN 1194-65-6

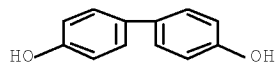
CMF C7 H3 Cl2 N



CM 3

CRN 92-88-6

CMF C12 H10 O2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST hydrogen fueled fuel cell; polymer
electrolyte membrane catalyst assembly

IT Carbon black

RL: TEM (Technical or engineered material use); USES (Uses)
(Vulcan XC 72R, gas diffusion layer; manufacture of

10/714,394-267960-EIC 1700 SEARCH

- polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)
- IT Polyoxyalkylenes
RL: TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)
- IT Fluoropolymers
RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)
- IT Polysulfones
RL: IMF (Industrial manufacture); POF (Polymer in formulation);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)
(polybenzimidazole-, sulfonic acid and phosphonic acid
group-containing; polymer electrolyte
membrane/electrode assembly (MEA), its
manufacture, and its hydrogen-fueled polymer
electrolyte fuel cells)
- IT Fuel cells
(polymer electrolyte; polymer
electrolyte membrane/electrode
assembly (MEA), its manufacture, and its hydrogen-fueled
polymer electrolyte fuel
cells)
- IT Fluoropolymers
RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, Nafion; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)
- IT Ionomers
RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and
sulfo-containing, Nafion; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)
- IT Polysulfones
RL: IMF (Industrial manufacture); POF (Polymer in formulation);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)
(polyoxyphenylene-, oxynitrile-, sulfonic acid group-containing;
polymer electrolyte membrane/
electrode assembly (MEA), its manufacture, and its
hydrogen-fueled polymer electrolyte
fuel cells)
- IT Polyoxyphenylenes
RL: IMF (Industrial manufacture); POF (Polymer in formulation);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)
(polysulfone-, oxynitrile-, sulfonic acid group-containing;
polymer electrolyte membrane/
electrode assembly (MEA), its manufacture, and its
hydrogen-fueled polymer electrolyte
fuel cells)
- IT Polybenzimidazoles
RL: IMF (Industrial manufacture); POF (Polymer in formulation);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)
(polysulfone-, sulfonic acid and phosphonic acid group-containing;
polymer electrolyte membrane/

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electrode assembly (MEA), its manufacture, and its
hydrogen-fueled polymer electrolyte
fuel cells)

- IT 7440-06-4, Platinum 7440-44-0, Carbon
RL: CAT (Catalyst use); USES (Uses)
(Pt/carbon electrode catalyst
layer; manufacture of polymer electrolyte
membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)
- IT 9002-84-0, Polyflon D 1E
RL: TEM (Technical or engineered material use); USES (Uses)
(carbon paper water-proofed with; manufacture of polymer
electrolyte membrane/electrode
assembly for hydrogen-fueled polymer
electrolyte fuel cells)
- IT 354114-33-3, TGP-H 060
RL: TEM (Technical or engineered material use); USES (Uses)
(gas diffusion layer; manufacture of polymer
electrolyte membrane/electrode
assembly for hydrogen-fueled polymer
electrolyte fuel cells)
- IT 681035-31-4P, 4,4'-Biphenol-2,6-dichlorobenzonitrile-3,3'-
disulfo-4,4'-dichlorodiphenylsulfone disodium salt
copolymer 861709-53-7P, 2,5-Dicarboxybenzenesulfonic
acid monosodium salt-3,5-dicarboxyphenylphosphonic
acid-3,3',4,4'-tetraaminodiphenyl sulfone copolymer
RL: IMF (Industrial manufacture); POF (Polymer in formulation);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)
(polymer electrolyte membrane/
electrode assembly (MEA), its manufacture, and its
hydrogen-fueled polymer electrolyte
fuel cells)

L51 ANSWER 4 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2008:859822 HCAPLUS Full-text
DOCUMENT NUMBER: 149:157283
TITLE: Polymer electrolyte

membrane/electrode assembly
(MEA), its manufacture, and its
hydrogen-fueled polymer
electrolyte fuel
cells

INVENTOR(S): Kitamura, Kota; Sakaguchi, Yoshimitsu;
Yamaguchi, Hiroki; Yamashita, Masahiro;
Yamada, Takatoshi; Takase, Satoshi; Miyagawa,
Shinji
PATENT ASSIGNEE(S): Toyobo Co., Ltd., Japan; Nissan Motor Co.,
Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 14pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2008166036	A	20080717	JP 2006-352148	

2006
1227

PRIORITY APPLN. INFO.: JP 2006-352148

2006
1227

10/714,394-267960-EIC 1700 SEARCH

ED Entered STN: 18 Jul 2008
GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT
*

AB The MEA contains a polymer electrolyte membrane comprising a polymer represented by the general formula I [$n_1, n_2, m_1-m_3 = \geq 1$ -integer satisfying $n_1/(n_1 + n_2) = 0.40-0.70$, $m_3/(m_1 + m_2 + m_3) = 0.005-0.05$, and $m_2/(m_1 + m_2 + m_3) = 0.01-0.20$] and an electrode catalyst layer which is bonded directly at least on one side of the polymer electrolyte membrane, where the surface roughness of the membrane/catalyst interface is $\leq 1 \mu\text{m}$. The MEA is prepared by direct application of a catalyst slurry containing an electrode catalyst, a polymer electrolyte and a solvent at least on one side of the polymer electrolyte membrane of a polymer I in such a way that the surface roughness of the membrane/catalyst interface becomes $\leq 1 \mu\text{m}$. The hydrogen-fueled polymer electrolyte fuel cell shows high output performance even in low moisturizing condition and also shows excellent durability.

IT 916849-47-3P

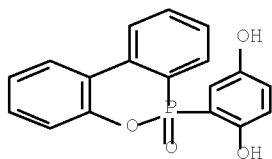
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

RN 916849-47-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

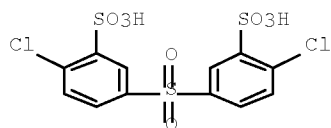
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CRN 99208-50-1
CMF C18 H13 O4 P



CM 2

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na

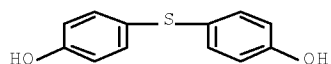


● 2 Na

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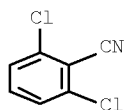
CM 3

CRN 2664-63-3
CMF C12 H10 O2 S



CM 4

CRN 1194-65-6
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6
CMF C12 H10 O2



CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST hydrogen fueled polymer electrolyte
fuel cell; polymer electrolyte
membrane electrode assembly
IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Vulcan XC 72R, gas diffusion layer; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)
IT Polyoxyalkylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; manufacture of
polymer electrolyte membrane/
electrode assembly for hydrogen-fueled polymer
electrolyte fuel cells)
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of polymer electrolyte

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membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

IT Polythioethers

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyoxyarylene-polysulfone-, cyano-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Polysulfones, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyoxyarylene-polythioether-, cyano-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Polyoxyarylenes

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polysulfone-polythioether-, cyano-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Fuel cells

(polymer electrolyte; polymer electrolyte membrane/electrode assembly (MEA), its manufacture, and its hydrogen-fueled polymer electrolyte fuel cells)

IT Fluoropolymers, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Ionomers

RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyoxyarylene-polysulfone-polythioether-, cyano-containing; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 9002-84-0, Polyflon D 1E

RL: TEM (Technical or engineered material use); USES (Uses)
(carbon paper waterproofed with; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 354114-33-3, TGP-H 060

RL: TEM (Technical or engineered material use); USES (Uses)
(gas diffusion layer; manufacture of polymer electrolyte membrane/electrode assembly for hydrogen-fueled polymer electrolyte fuel cells)

IT 916849-47-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of polymer electrolyte

membrane/electrode assembly for
hydrogen-fueled polymer electrolyte
fuel cells)

L51 ANSWER 5 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2008:859797 HCAPLUS Full-text
DOCUMENT NUMBER: 149:132488
TITLE: Membrane electrode
assembly (MEA) with proton conductive
membrane having excellent
processability and high proton conductivity
for polymer electrolyte
fuel cells
INVENTOR(S): Kanaoka, Osayuki; Soma, Hiroshi; Ishimaru,
Ryuhei
PATENT ASSIGNEE(S): Honda Motor Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 36pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	

JP 2008166003	A	20080717	JP 2006-351050	2006 1227
PRIORITY APPLN. INFO.:			JP 2006-351050	2006 1227

$$\begin{array}{c}
 \left[\left[\begin{array}{c} \text{R1} \quad \text{R2} \\ \diagup \quad \diagdown \\ \text{C}_6\text{H}_2 \\ \diagdown \quad \diagup \\ \text{R5} \quad \text{R4} \end{array} \right]_s \text{A} \left[\begin{array}{c} \text{R5} \quad \text{R6} \\ \diagup \quad \diagdown \\ \text{C}_6\text{H}_2 \\ \diagdown \quad \diagup \\ \text{R7} \quad \text{R8} \end{array} \right] \text{B-T-B} \left[\left[\begin{array}{c} \text{R1} \quad \text{R2} \\ \diagup \quad \diagdown \\ \text{C}_6\text{H}_2 \\ \diagdown \quad \diagup \\ \text{R5} \quad \text{R4} \end{array} \right]_s \text{A} \left[\begin{array}{c} \text{R5} \quad \text{R6} \\ \diagup \quad \diagdown \\ \text{C}_6\text{H}_2 \\ \diagdown \quad \diagup \\ \text{R7} \quad \text{R8} \end{array} \right]_s \right]_r \\
 \text{I}
 \end{array}$$

$$\begin{array}{c}
 \left[\left[\begin{array}{c} \text{R11} \quad \text{R9} \\ \diagup \quad \diagdown \\ \text{C}_6\text{H}_2 \\ \diagdown \quad \diagup \\ \text{R12} \quad \text{R10} \end{array} \right]_t \text{C} \left[\begin{array}{c} \text{R13} \quad \text{R15} \\ \diagup \quad \diagdown \\ \text{C}_6\text{H}_2 \\ \diagdown \quad \diagup \\ \text{R14} \quad \text{R16} \end{array} \right] \right]_t \\
 \text{II}
 \end{array}$$

$$\begin{array}{c}
 \text{R17} \quad \text{R17} \\
 \diagup \quad \diagdown \quad \quad \diagup \quad \diagdown \\
 \text{C}_6\text{H}_2 \quad \text{D} \quad \text{C}_6\text{H}_2 \\
 \diagdown \quad \diagup \quad \quad \diagdown \quad \diagup \\
 \text{R18} \quad \text{R18} \\
 \text{III}
 \end{array}$$

Page 18

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= aliphatic hydrocarbyl, aromatic hydrocarbyl, halogenated hydrocarbyl), cyclohexylidene, fluorenylidene, O, S; B = O, S; D = CMe₂, 1,1-cyclohexylidene; R1-R16 = H, F, alkyl, (partially) halogenated alkyl, allyl, aryl, nitro, nitrile; R17, R18 = H, Me, iso-Pr, iso-Bu, tert-Bu, cyclohexyl; s, t = 0-4 integer; r ≥ 1 integer].

IT 1036334-46-9P 1036334-51-6P
1036334-55-0P 1036334-58-3P
1036334-60-7P 1036334-62-9P
1036334-64-1P 1036334-68-5P
1036334-72-1P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

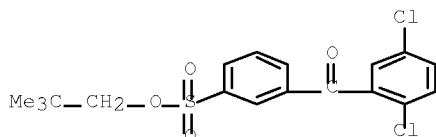
RN 1036334-46-9 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone and 5,5'-(1-methylethylidene)bis[[1,1'-biphenyl]-2-ol], block (CA INDEX NAME)

CM 1

CRN 847972-43-4

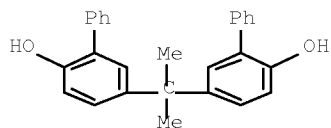
CMF C18 H18 Cl2 O4 S



CM 2

CRN 24038-68-4

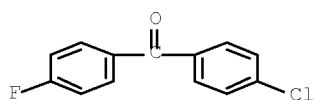
CMF C27 H24 O2



CM 3

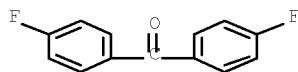
CRN 2069-48-9

CMF C13 H8 Cl F O



CM 4

CRN 345-92-6
 CMF C13 H8 F2 O

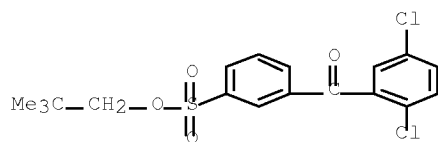


RN 1036334-51-6 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 5,5'-(9H-fluoren-9-ylidene)bis[[1,1'-biphenyl]-2-ol] and 4,4'-(1-methylethylidene)bis[2,6-dimethylphenol], block (CA INDEX NAME)

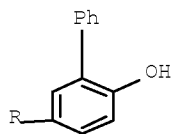
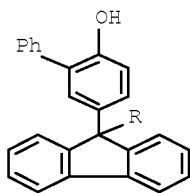
CM 1

CRN 847972-43-4
 CMF C18 H18 Cl2 O4 S



CM 2

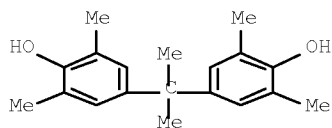
CRN 161256-84-4
 CMF C37 H26 O2



CM 3

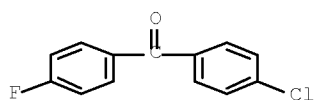
10/714,394-267960-EIC 1700 SEARCH

CRN 5613-46-7
CMF C19 H24 O2



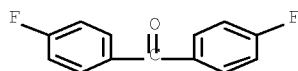
CM 4

CRN 2069-48-9
CMF C13 H8 Cl F O



CM 5

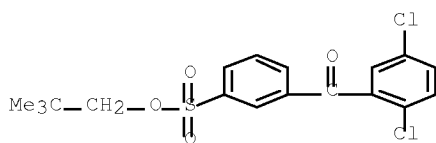
CRN 345-92-6
CMF C13 H8 F2 O



RN 1036334-55-0 HCAPLUS
CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 5,5'-(9H-fluoren-9-ylidene)bis[[1,1'-biphenyl]-2-ol] and 5,5'-(1-methylethylidene)bis[[1,1'-biphenyl]-2-ol], block (CA INDEX NAME)

CM 1

CRN 847972-43-4
CMF C18 H18 Cl2 O4 S

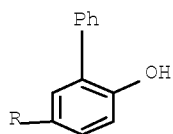
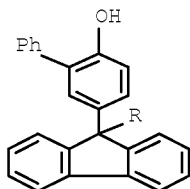


10/714,394-267960-EIC 1700 SEARCH

CM 2

CRN 161256-84-4

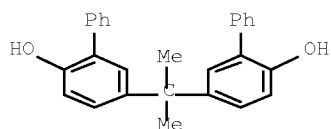
CMF C37 H26 O2



CM 3

CRN 24038-68-4

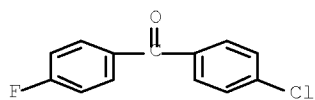
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CM 4

CRN 2069-48-9

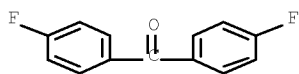
CMF C13 H8 Cl F O



CM 5

CRN 345-92-6

CMF C13 H8 F2 O

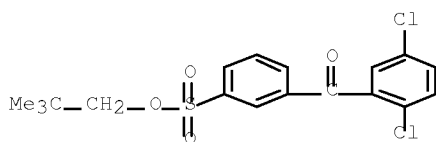


RN 1036334-58-3 HCAPLUS
 CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 4,4'-cyclohexylidenebis[2,6-dimethylphenol] and 5,5'-(9H-fluoren-9-ylidene)bis[[1,1'-biphenyl]-2-ol], block (CA INDEX NAME)

CM 1

CRN 847972-43-4

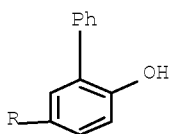
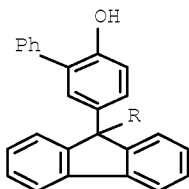
CMF C18 H18 Cl2 O4 S



CM 2

CRN 161256-84-4

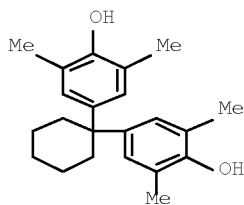
CMF C37 H26 O2



CM 3

CRN 30560-61-3

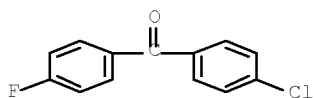
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CM 4

CRN 2069-48-9

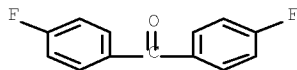
CMF C13 H8 Cl F O



CM 5

CRN 345-92-6

CMF C13 H8 F2 O



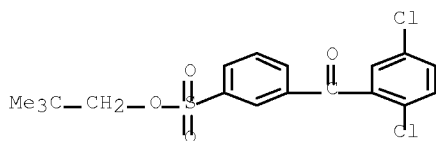
RN 1036334-60-7 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 4,4'-cyclohexylidenebis[2-cyclohexylphenol] and 5,5'-(9H-fluoren-9-ylidene)bis[[1,1'-biphenyl]-2-ol], block (CA INDEX NAME)

CM 1

CRN 847972-43-4

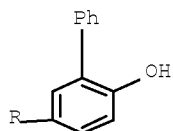
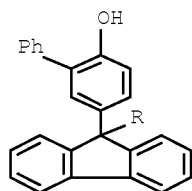
CMF C18 H18 Cl2 O4 S



CM 2

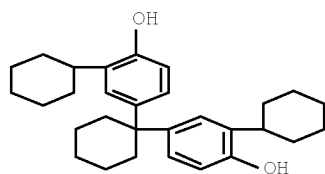
10/714,394-267960-EIC 1700 SEARCH

CRN 161256-84-4
CMF C37 H26 O2



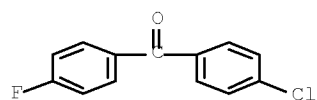
CM 3

CRN 4221-68-5
CMF C30 H40 O2



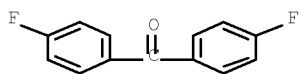
CM 4

CRN 2069-48-9
CMF C13 H8 Cl F O



CM 5

CRN 345-92-6
CMF C13 H8 F2 O

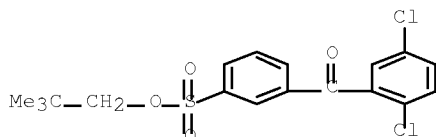


RN 1036334-62-9 HCAPLUS
 CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 4,4'-(1-methylethylidene)bis[2,6-dimethylphenol] and 4,4'-[1,3-phenylenebis(1-methylethylidene)]bis[phenol], block (CA INDEX NAME)

CM 1

CRN 847972-43-4

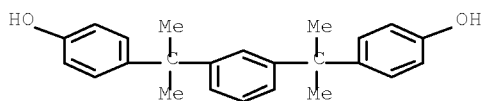
CMF C18 H18 Cl2 O4 S



CM 2

CRN 13595-25-0

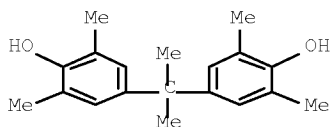
CMF C24 H26 O2



CM 3

CRN 5613-46-7

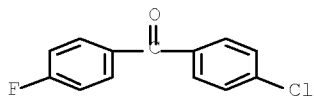
CMF C19 H24 O2



CM 4

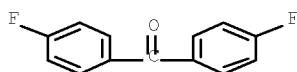
10/714,394-267960-EIC 1700 SEARCH

CRN 2069-48-9
CMF C13 H8 Cl F O



CM 5

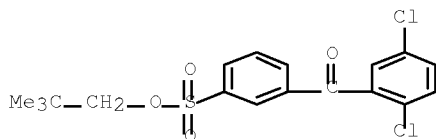
CRN 345-92-6
CMF C13 H8 F2 O



RN 1036334-64-1 HCAPLUS
CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 5,5'-(1-methylethylidene)bis[[1,1'-biphenyl]-2-ol] and 4,4'-[1,3-phenylenebis(1-methylethylidene)]bis[phenol], block (CA INDEX NAME)

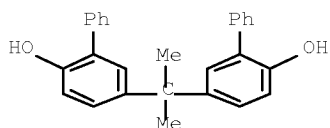
CM 1

CRN 847972-43-4
CMF C18 H18 Cl2 O4 S



CM 2

CRN 24038-68-4
CMF C27 H24 O2

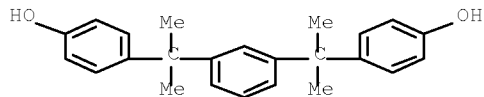


10/714,394-267960-EIC 1700 SEARCH

CM 3

CRN 13595-25-0

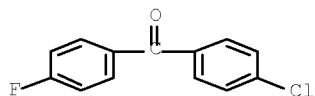
CMF C24 H26 O2



CM 4

CRN 2069-48-9

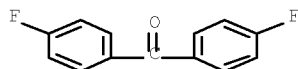
CMF C13 H8 Cl F O



CM 5

CRN 345-92-6

CMF C13 H8 F2 O



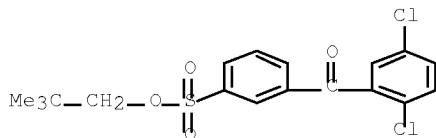
RN 1036334-68-5 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 4,4'-cyclohexylidenebis[2,6-dimethylphenol] and 4,4'-[1,3-phenylenebis(1-methylethylidene)]bis[phenol], block (CA INDEX NAME)

CM 1

CRN 847972-43-4

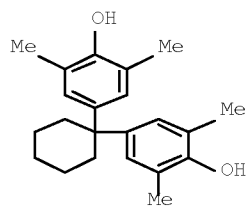
CMF C18 H18 Cl2 O4 S



CM 2

CRN 30560-61-3

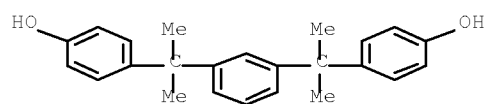
CMF C22 H28 O2



CM 3

CRN 13595-25-0

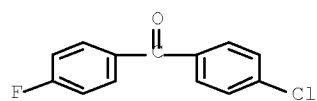
CMF C24 H26 O2



CM 4

CRN 2069-48-9

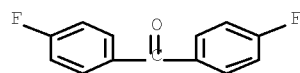
CMF C13 H8 Cl F O



CM 5

CRN 345-92-6

CMF C13 H8 F2 O



10/714,394-267960-EIC 1700 SEARCH

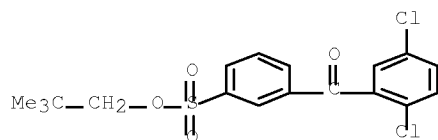
RN 1036334-72-1 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-fluorophenyl)methanone, (4-chlorophenyl)(4-fluorophenyl)methanone, 4,4'-cyclohexylidenebis[2-cyclohexylphenol] and 4,4'-[1,3-phenylenebis(1-methylethylidene)]bis[phenol] (CA INDEX NAME)

CM 1

CRN 847972-43-4

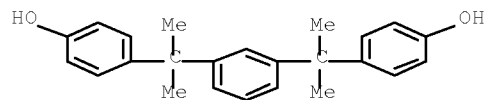
CMF C18 H18 Cl2 O4 S



CM 2

CRN 13595-25-0

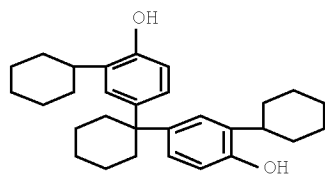
CMF C24 H26 O2



CM 3

CRN 4221-68-5

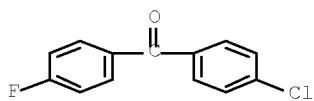
CMF C30 H40 O2



CM 4

CRN 2069-48-9

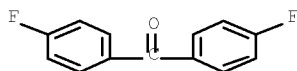
CMF C13 H8 Cl F O



CM 5

CRN 345-92-6

CMF C13 H8 F2 O



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST sulfonated polyarylene proton conductive membrane;
membrane electrode assembly polymer
electrolyte fuel cell
- IT Carbon black, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst with platinum; membrane
electrode assembly with proton-conductive
membrane having excellent processability and high
proton conductivity for polymer electrolyte
fuel cells)
- IT Polyoxyalkylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, ion-
conductive binder; membrane electrode
assembly with proton-conductive membrane having
excellent processability and high proton conductivity for
polymer electrolyte fuel
cells)
- IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(membrane electrode assembly with
proton-conductive membrane having excellent
processability and high proton conductivity for polymer
electrolyte fuel cells)
- IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-, sulfo-containing, block, cardo; membrane
electrode assembly with proton-conductive
membrane having excellent processability and high
proton conductivity for polymer electrolyte
fuel cells)
- IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyether-, sulfo-containing, block; membrane
electrode assembly with proton-conductive
membrane having excellent processability and high
proton conductivity for polymer electrolyte
fuel cells)
- IT Cardo polymers
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)

10/714,394-267960-EIC 1700 SEARCH

(polyether-polyketones, sulfo-containing, block; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, sulfo-containing, block, cardo; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, sulfo-containing, block; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT Fuel cells

(polymer electrolyte; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT Fluoropolymers, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, ion-conductive binder; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT Ionomers

RL: TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, ion-conductive binder; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT 9002-84-0, Polytetrafluoroethylene

RL: TEM (Technical or engineered material use); USES (Uses)
(carbon black blend, underlying layer on carbon paper, gas diffusion layer; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses

RL: CAT (Catalyst use); USES (Uses)
(catalyst with carbon black; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

IT 1036334-44-7P 1036334-48-1P 1036334-53-8P 1036334-57-2P
1036334-59-4P 1036334-61-8P 1036334-63-0P 1036334-66-3P
1036334-70-9P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer

10/714,394-267960-EIC 1700 SEARCH

electrolyte fuel cells)
 IT 1036334-46-9P 1036334-51-6P
 1036334-55-0P 1036334-58-3P
 1036334-60-7P 1036334-62-9P
 1036334-64-1P 1036334-68-5P
 1036334-72-1P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)
 IT 7440-44-0, Carbon, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (paper, gas diffusion layer; membrane electrode assembly with proton-conductive membrane having excellent processability and high proton conductivity for polymer electrolyte fuel cells)

L51 ANSWER 6 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:734344 HCAPLUS Full-text

DOCUMENT NUMBER: 149:57685

TITLE: Membrane electrode assembly having electrode layers with controlled pore-volume distribution, and its manufacture
 INVENTOR(S): Kawai, Junji; Higami, Makoto; Wakabayashi, Nobuaki; Nakagawa, Shigeo; Kanaoka, Osayuki; Matsuo, Junji

PATENT ASSIGNEE(S): JSR Ltd., Japan; Honda Motor Co., Ltd.

SOURCE: Jpn. Kokai Tokkyo Koho, 44pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2008140608	A	20080619	JP 2006-323990	2006 1130

PRIORITY APPLN. INFO.: JP 2006-323990
 2006
 1130

ED Entered STN: 19 Jun 2008

AB The membrane electrode assembly (MEA) contains an anode and cathode, each containing catalyst particles and polymeric electrolytes, on either side of an ion-conducting membrane. In the anode and/or cathode, the ratio (V2/V1) of the pore volume (V2) within a 50 weight% (based on total electrode weight) region in the thickness direction from the ion-conducting membrane side toward the electrode surface to the pore volume (V1) within a 50 weight% region in the thickness direction from the electrode surface toward the ion-conducting membrane side is ≥ 85 to $< 100\%$. The MEA is manufactured by application of electrode pastes containing polymeric electrolytes (PE) and catalyst particles (CP) in ≥ 2 steps to form multilayers on the ion-conducting membrane, wherein the ratio (P1/P2) of PE/CP weight ratio (P1) in electrode pastes for the 2nd and subsequent layers to PE/CP weight ratio (P2) in electrode pastes for the 1st layer is 110-400%. The polymeric electrolytes may be sulfo-containing arylene polymers. The MEA having catalyst layers exhibits high power generation performance and durability.

IT 1033133-35-SDP, hydrolyzed
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (electrolyte; manufacture of polymer

10/714,394-267960-EIC 1700 SEARCH

electrolyte fuel cell
membrane-electrode assembly having
electrode layers with controlled pore-volume
distribution)

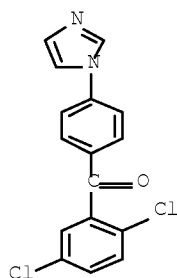
RN 1033133-35-5 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl
ester, polymer with 2,6-dichlorobenzonitrile, (2,5-
dichlorophenyl)[4-(1H-imidazol-1-yl)phenyl]methanone and
4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol],
block (CA INDEX NAME)

CM 1

CRN 919769-45-2

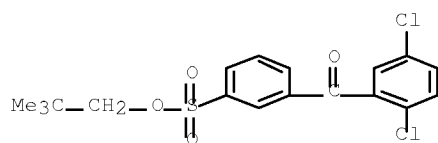
CMF C16 H10 Cl2 N2 O



CM 2

CRN 847972-43-4

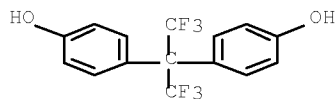
CMF C18 H18 Cl2 O4 S



CM 3

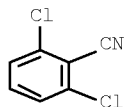
CRN 1478-61-1

CMF C15 H10 F6 O2



CM 4

CRN 1194-65-6
 CMF C7 H3 Cl2 N



- RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (manuf. of polymer electrolyte fuel
 cell membrane-electrode assembly
 having electrode layers with controlled
 pore-vol. distribution)
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 35, 38, 67
- ST polymer electrolyte fuel
 cell membrane electrode;
 cathode anode pore vol catalyst fuel
 cell
- IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (acrylic, electrodes containing; manufacture of
 polymer electrolyte fuel
 cell membrane-electrode assembly
 having electrode layers with controlled
 pore-volume distribution)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (aromatic, fluorine- and sulfo-containing, block, electrolyte
 ; manufacture of polymer electrolyte
 fuel cell membrane-
 electrode assembly having electrode
 layers with controlled pore-volume distribution)
- IT Polyethers, preparation
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP
 (Preparation); RACT (Reactant or reagent)
 (aromatic, fluorine-containing; manufacture of polymer
 electrolyte fuel cell
 membrane-electrode assembly having
 electrode layers with controlled pore-volume
 distribution)
- IT Oxidation catalysts
 Reduction catalysts
 (electrochem.; manufacture of polymer electrolyte
 fuel cell membrane-
 electrode assembly having electrode
 layers with controlled pore-volume distribution)
- IT Acrylic polymers, uses
 Polyolefins
 RL: TEM (Technical or engineered material use); USES (Uses)
 (fluorine-containing, electrodes containing; manufacture of
 polymer electrolyte fuel
 cell membrane-electrode assembly
 having electrode layers with controlled
 pore-volume distribution)
- IT Water-resistant materials
 (fluoropolymers, electrodes containing; manufacture of
 polymer electrolyte fuel
 cell membrane-electrode assembly)

10/714,394-267960-EIC 1700 SEARCH

- having electrode layers with controlled pore-volume distribution)
- IT Fuel cell anodes
 - Fuel cell cathodes
 - Fuel cell electrolytes
 - (manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT Fluoropolymers, uses
 - RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 - (polyether-, aromatic, sulfo-containing, block, electrolyte; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT Fluoropolymers, preparation
 - RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 - (polyether-, aromatic; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT Fuel cells
 - (polymer electrolyte; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT Ionic conductors
 - (polymeric; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT Fluoropolymers, uses
 - RL: TEM (Technical or engineered material use); USES (Uses)
 - (polyolefin-, electrodes containing; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT 390761-63-4, TEC 10E50E
 - RL: CAT (Catalyst use); USES (Uses)
 - (catalyst particle; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT 7440-06-4, Platinum, uses
 - RL: CAT (Catalyst use); USES (Uses)
 - (catalyst, carbon particle-supported; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT 613687-03-9, 2-Hydroxyethyl vinyl ether-hexafluoropropylene copolymer
 - RL: TEM (Technical or engineered material use); USES (Uses)
 - (electrodes containing; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)
- IT 1033133-35-SDP, hydrolyzed

10/714,394-267960-EIC 1700 SEARCH

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrolyte; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)

IT 193410-36-5P, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile copolymer
193410-37-6P 919769-45-2P, 2,5-Dichloro-4'-(1-imidazolyl)benzophenone 1033133-35-5P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)

IT 288-32-4, Imidazole, reactions 270903-87-2, 2,5-Dichloro-4'-fluorobenzophenone

RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)
(particles, platinum catalyst supported on; manufacture of polymer electrolyte fuel cell membrane-electrode assembly having electrode layers with controlled pore-volume distribution)

L51 ANSWER 7 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:412531 HCAPLUS Full-text

DOCUMENT NUMBER: 148:406438

TITLE: Sulfonic acid group-containing polymers, compositions thereof, polyelectrolyte membranes, membrane/electrode assemblies, and fuel cells

INVENTOR(S): Kitamura, Kota; Sakaguchi, Yoshimitsu; Yamaguchi, Hiroki; Yamashita, Masahiro; Sasai, Kosuke

PATENT ASSIGNEE(S): Toyobo Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 37pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2008074946	A	20080403	JP 2006-255281	

2006

0921

PRIORITY APPLN. INFO.: JP 2006-255281

2006

0921

ED Entered STN: 03 Apr 2008

AB Title polymers have Q1XQ2, Ar1, Z1-p-C6H4Z2-p-C6H4Z1, Z3-p-C6H4-p-C6H4Z3, and Z4Ar2(R2)nZ4 units [X = SO2, CO; Q1 = 2-R1SO3Y-1,4-phenylene; Q2 = 3-R1SO3Y-1,4-phenylene; R1 = C1-10 alkylene, oxyalkylene, aryl group, direct link; Y = H, cation; Z1, Z3, Z4 = O, S; Z2 = O, S, CMe2; C(CF3)2, CH2, cyclohexyl group; Ar1 = electron attractive group-containing bivalent aromatic group; Ar2 = aromatic group; R2 = C2-30

10/714,394-267960-EIC 1700 SEARCH

alkyl; n = 1-4]. Thus, disodium 4,4'-dichlorodiphenyl sulfone-3,3'-disulfonate 70.00, 2,6-dichlorobenzonitrile 26.55, 4,4'-biphenol 44.22, bis(4-hydroxyphenyl) sulfide 6.48, and 4-hexylresorcinol 5.77 g were polymerized in NMP in the presence of K₂CO₃ and mol. sieves, washed, and dried to give a polymer, 7 g of which was dissolved in NMP, cast on a glass sheet, dried, peeled from the glass sheet, immersed in H₂O and 2 mol/L H₂SO₄ successively, washed, and dried to give a polyelectrolyte membrane showing ion exchange capacity 2.20 mequiv/g, proton conductivity 0.066 S/cm at 80° and relative humidity 66%, and good durability in a fuel cell.

IT 1016645-49-0P 1016645-50-3P
1016645-51-4P 1016645-52-5P
1016645-53-6P 1016645-54-7P
1016645-55-8P 1016645-56-9P
1016645-57-0P 1016645-58-1P
1016645-60-5P 1016645-61-6P
1016645-62-7P 1016645-63-8P
1016645-64-9P

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

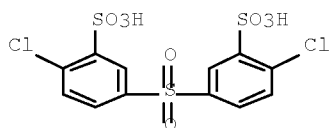
RN 1016645-49-0 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4-hexyl-1,3-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

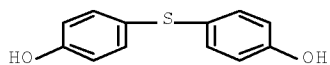


●2 Na

CM 2

CRN 2664-63-3

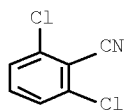
CMF C12 H10 O2 S



CM 3

CRN 1194-65-6

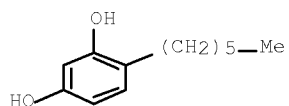
CMF C7 H3 Cl2 N



CM 4

CRN 136-77-6

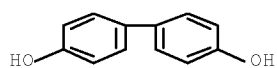
CMF C12 H18 O2



CM 5

CRN 92-88-6

CMF C12 H10 O2



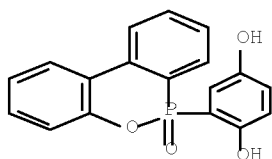
RN 1016645-50-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4-hexyl-1,3-benzenediol, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 99208-50-1

CMF C18 H13 O4 P

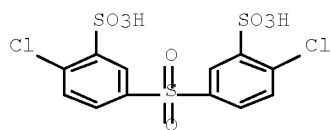


CM 2

CRN 51698-33-0

10/714,394-267960-EIC 1700 SEARCH

CMF C12 H8 Cl2 O8 S3 . 2 Na

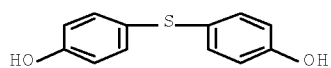


● 2 Na

CM 3

CRN 2664-63-3

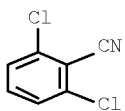
CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

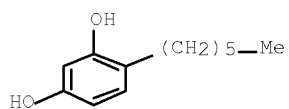
CMF C7 H3 Cl2 N



CM 5

CRN 136-77-6

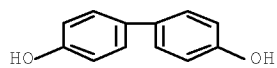
CMF C12 H18 O2



CM 6

CRN 92-88-6

CMF C12 H10 O2



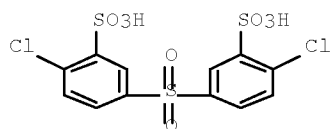
RN 1016645-51-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4-hexyl-1,3-benzenediol and 4,4'-thiobis[benzenethiol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

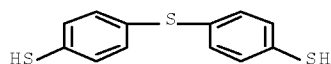


● 2 Na

CM 2

CRN 19362-77-7

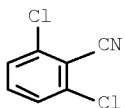
CMF C12 H10 S3



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N

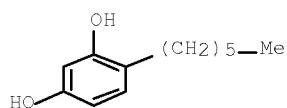


CM 4

CRN 136-77-6

10/714,394-267960-EIC 1700 SEARCH

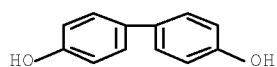
CMF C12 H18 O2



CM 5

CRN 92-88-6

CMF C12 H10 O2



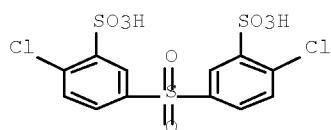
RN 1016645-52-5 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4-hexyl-1,3-benzenediol and 4,4'-oxybis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

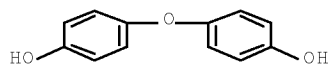


● 2 Na

CM 2

CRN 1965-09-9

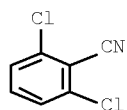
CMF C12 H10 O3



CM 3

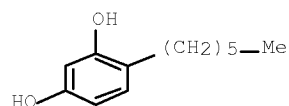
10/714,394-267960-EIC 1700 SEARCH

CRN 1194-65-6
CMF C7 H3 Cl2 N



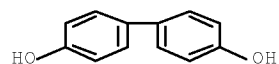
CM 4

CRN 136-77-6
CMF C12 H18 O2



CM 5

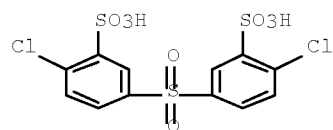
CRN 92-88-6
CMF C12 H10 O2



RN 1016645-53-6 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4-hexyl-1,3-benzenediol and 4,4'-(1-methylethylidene)bis[phenol] (CA INDEX NAME)

CM 1

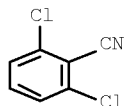
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

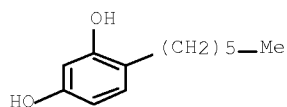
CM 2

CRN 1194-65-6
 CMF C7 H3 Cl2 N



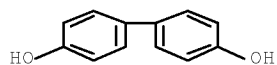
CM 3

CRN 136-77-6
 CMF C12 H18 O2



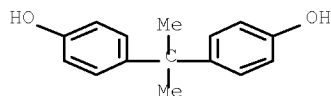
CM 4

CRN 92-88-6
 CMF C12 H10 O2



CM 5

CRN 80-05-7
 CMF C15 H16 O2



RN 1016645-54-7 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt
 (1:2), polymer with [1,1'-biphenyl]-4,4'-diol,
 2,6-dichlorobenzonitrile, 4-hexyl-1,3-benzenediol and
 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol]

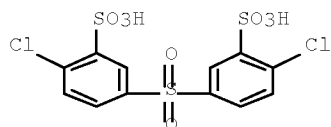
10/714,394-267960-EIC 1700 SEARCH

(CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

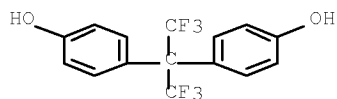


● 2 Na

CM 2

CRN 1478-61-1

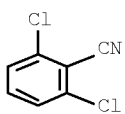
CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

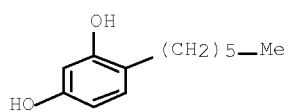
CMF C7 H3 Cl2 N



CM 4

CRN 136-77-6

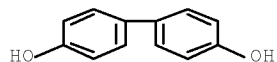
CMF C12 H18 O2



10/714,394-267960-EIC 1700 SEARCH

CM 5

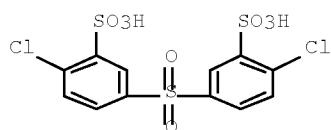
CRN 92-88-6
CMF C12 H10 O2



RN 1016645-55-8 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 4,4'-cyclohexylidenebis[phenol], 2,6-dichlorobenzonitrile and 4-hexyl-1,3-benzenediol (CA INDEX NAME)

CM 1

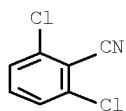
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

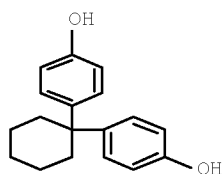
CM 2

CRN 1194-65-6
CMF C7 H3 Cl2 N



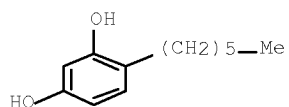
CM 3

CRN 843-55-0
CMF C18 H20 O2



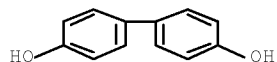
CM 4

CRN 136-77-6
CMF C12 H18 O2



CM 5

CRN 92-88-6
CMF C12 H10 O2

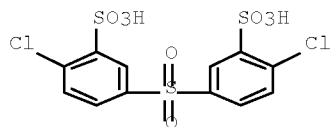


RN 1016645-56-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt
(1:2), polymer with [1,1'-biphenyl]-4,4'-diol,
2,6-dichlorobenzonitrile, 4-hexyl-1,3-benzenediol and
4,4'-methylenebis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na

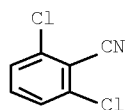


● 2 Na

CM 2

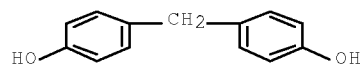
10/714,394-267960-EIC 1700 SEARCH

CRN 1194-65-6
CMF C7 H3 Cl2 N



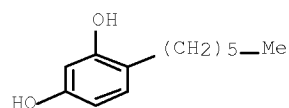
CM 3

CRN 620-92-8
CMF C13 H12 O2



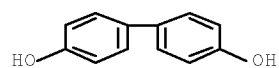
CM 4

CRN 136-77-6
CMF C12 H18 O2



CM 5

CRN 92-88-6
CMF C12 H10 O2



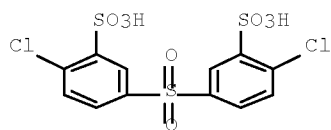
RN 1016645-57-0 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 4-(1,1,3,3-tetramethylbutyl)-1,3-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

10/714,394-267960-EIC 1700 SEARCH

CMF C12 H8 Cl2 O8 S3 . 2 Na

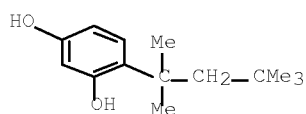


● 2 Na

CM 2

CRN 28122-52-3

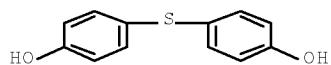
CMF C14 H22 O2



CM 3

CRN 2664-63-3

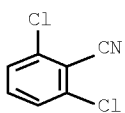
CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

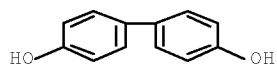
CMF C7 H3 Cl2 N



CM 5

CRN 92-88-6

CMF C12 H10 O2



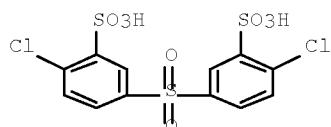
RN 1016645-58-1 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2,6-dichlorobenzonitrile, 2-(1,1-dimethylethyl)-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

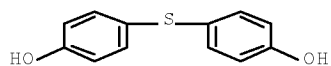


● 2 Na

CM 2

CRN 2664-63-3

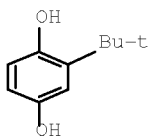
CMF C12 H10 O2 S



CM 3

CRN 1948-33-0

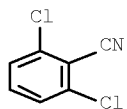
CMF C10 H14 O2



CM 4

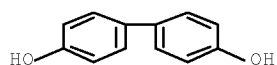
10/714,394-267960-EIC 1700 SEARCH

CRN 1194-65-6
CMF C7 H3 Cl2 N



CM 5

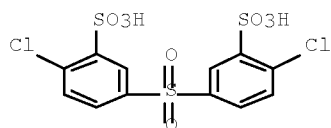
CRN 92-88-6
CMF C12 H10 O2



RN 1016645-60-5 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2-hexyl-1,4-benzenediol, 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

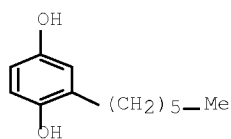
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

CM 2

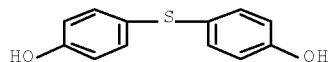
CRN 4197-72-2
CMF C12 H18 O2



10/714,394-267960-EIC 1700 SEARCH

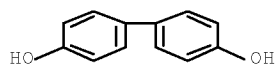
CM 3

CRN 2664-63-3
CMF C12 H10 O2 S



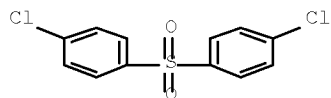
CM 4

CRN 92-88-6
CMF C12 H10 O2



CM 5

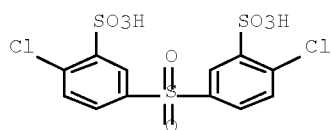
CRN 80-07-9
CMF C12 H8 Cl2 O2 S



RN 1016645-61-6 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-chlorophenyl)methanone, 2-hexyl-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

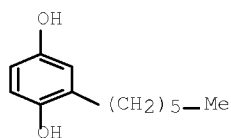
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



● 2 Na

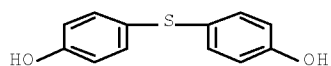
CM 2

CRN 4197-72-2
CMF C12 H18 O2



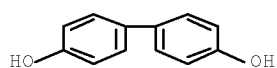
CM 3

CRN 2664-63-3
CMF C12 H10 O2 S



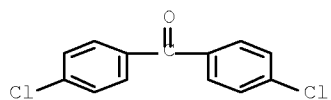
CM 4

CRN 92-88-6
CMF C12 H10 O2



CM 5

CRN 90-98-2
CMF C13 H8 Cl2 O



RN 1016645-62-7 HCAPLUS
CN Benzenesulfonic acid, 3,3'-carbonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol,

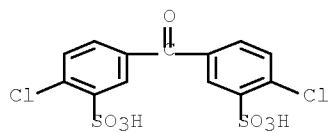
10/714,394-267960-EIC 1700 SEARCH

2,6-dichlorobenzonitrile, 2-hexyl-1,4-benzenediol and
4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 57004-46-3

CMF C13 H8 Cl2 O7 S2 . 2 Na

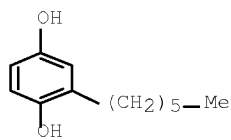


● 2 Na

CM 2

CRN 4197-72-2

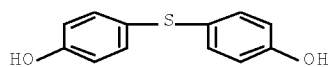
CMF C12 H18 O2



CM 3

CRN 2664-63-3

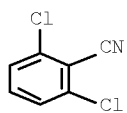
CMF C12 H10 O2 S



CM 4

CRN 1194-65-6

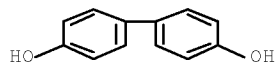
CMF C7 H3 Cl2 N



10/714,394-267960-EIC 1700 SEARCH

CM 5

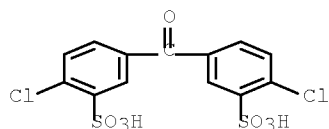
CRN 92-88-6
CMF C12 H10 O2



RN 1016645-63-8 HCAPLUS
CN Benzenesulfonic acid, 3,3'-carbonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, 2-hexyl-1,4-benzenediol, 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

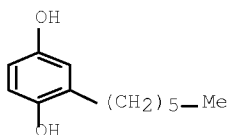
CRN 57004-46-3
CMF C13 H8 Cl2 O7 S2 . 2 Na



● 2 Na

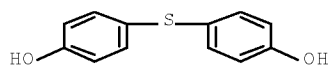
CM 2

CRN 4197-72-2
CMF C12 H18 O2



CM 3

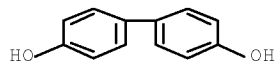
CRN 2664-63-3
CMF C12 H10 O2 S



CM 4

CRN 92-88-6

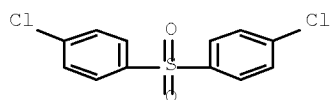
CMF C12 H10 O2



CM 5

CRN 80-07-9

CMF C12 H8 C12 O2 S



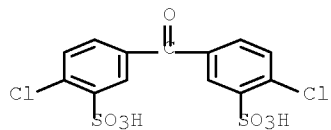
RN 1016645-64-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-chloro-, sodium salt (1:2), polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-chlorophenyl)methanone, 2-hexyl-1,4-benzenediol and 4,4'-thiobis[phenol] (CA INDEX NAME)

CM 1

CRN 57004-46-3

CMF C13 H8 C12 O7 S2 . 2 Na

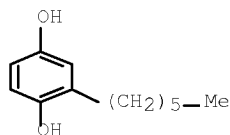


●2 Na

CM 2

CRN 4197-72-2

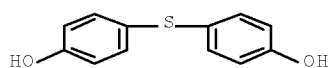
CMF C12 H18 O2



CM 3

CRN 2664-63-3

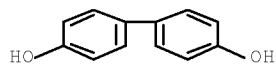
CMF C12 H10 O2 S



CM 4

CRN 92-88-6

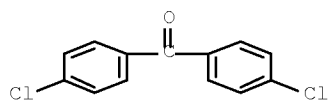
CMF C12 H10 O2



CM 5

CRN 90-98-2

CMF C13 H8 Cl2 O



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST sulfo polyether polysulfone polythioether polyelectrolyte
 membrane fuel cell
 IT Polyoxyalkylenes, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (fluorine- and sulfo-containing, ionomers, Nafion; sulfonic acid
 group-containing polymers for polyelectrolyte membranes
 for fuel cells)
 IT Polysulfones, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical

10/714,394-267960-EIC 1700 SEARCH

- or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-, aromatic, cardo; sulfonic acid group-containing polymers
 for polyelectrolyte membranes for fuel
 cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-, aromatic, fluorine-containing; sulfonic acid group-containing
 polymers for polyelectrolyte membranes for
 fuel cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-, aromatic; sulfonic acid group-containing polymers for
 polyelectrolyte membranes for fuel
 cells)
- IT Polythioethers
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polyketone-, aromatic; sulfonic acid group-containing
 polymers for polyelectrolyte membranes for
 fuel cells)
- IT Polythioethers
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polyketone-polysulfone-, aromatic; sulfonic acid
 group-containing polymers for polyelectrolyte membranes
 for fuel cells)
- IT Polysulfones, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polyketone-polythioether-, aromatic; sulfonic acid
 group-containing polymers for polyelectrolyte membranes
 for fuel cells)
- IT Fluoropolymers, uses
 Polythioethers
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfone-, aromatic; sulfonic acid group-containing
 polymers for polyelectrolyte membranes for
 fuel cells)
- IT Polyketones
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfone-polythioether-, aromatic; sulfonic acid
 group-containing polymers for polyelectrolyte membranes
 for fuel cells)
- IT Cardo polymers
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polysulfones, aromatic; sulfonic acid group-containing
 polymers for polyelectrolyte membranes for
 fuel cells)
- IT Polyketones
 Polysulfones, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polythioether-, aromatic; sulfonic acid group-containing
 polymers for polyelectrolyte membranes for
 fuel cells)
- IT Polyethers, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical
 or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polysulfone-polythioether-, aromatic; sulfonic acid
 group-containing polymers for polyelectrolyte membranes
 for fuel cells)
- IT Polyethers, uses

10/714,394-267960-EIC 1700 SEARCH

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polythioether-, aromatic; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Fuel cells
 (polymer electrolyte, direct methanol; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers, Nafion; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Ionomers
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-containing, Nafion; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Polyethers, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, aromatic, cardo; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Polyethers, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, aromatic, fluorine-containing; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Polyethers, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, aromatic; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Polyethers, uses
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-polythioether-, aromatic; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT Fuel cell electrodes
 Fuel cell electrolytes
 Polyelectrolytes
 (sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses
 RL: CAT (Catalyst use); USES (Uses)
 (carbon-supported, catalyst for fuel cells; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT 501004-25-7, TEC 61E54 918428-94-1, TEC 10V40E
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst for fuel cells; sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT 1016645-49-6P 1016645-50-3P
 1016645-51-4P 1016645-52-5P
 1016645-53-6P 1016645-54-7P
 1016645-55-8P 1016645-56-9P
 1016645-57-0P 1016645-58-1P
 1016645-60-5P 1016645-61-6P
 1016645-62-7P 1016645-63-8P

10/714,394-267960-EIC 1700 SEARCH

1016645-64-9F

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

IT 354114-33-3, TGPH 060 582300-03-6, Nafion SE 20192

RL: TEM (Technical or engineered material use); USES (Uses)
(sulfonic acid group-containing polymers for polyelectrolyte membranes for fuel cells)

L51 ANSWER 8 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:435110 HCAPLUS Full-text

DOCUMENT NUMBER: 146:405272

TITLE: Membrane-electrode
assemblies (MEA) containing
dissolution-suppressed Ru, their manufacture,
and direct methanol fuel
cells therewith

INVENTOR(S): Uete, Takao; Kono, Satoshi; Kidai, Masayuki

PATENT ASSIGNEE(S): Toray Industries, Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2007103293	A	20070419	JP 2005-294895	

2005

1007

PRIORITY APPLN. INFO.: JP 2005-294895

2005

1007

ED Entered STN: 20 Apr 2007

AB The title MEA, suppressing Ru in anode catalysts from dissolving and giving good durability to the fuel cells, have Ru-containing anode catalyst layers (A) and satisfy Ru(0)/Ru(tot) $\geq 40\%$ within $\leq 5\text{-}\mu\text{m}$ -depth surface region and Ru(cross)/Ru(tot) $\leq 2\%$ [Ru(0) = 0-valent Ru in A; Ru(tot) = total Ru in A; Ru(cross) = Ru crossed-over from A to cathode catalyst layers] when applied with 50-mA/cm² current for 100 h. The MEA are manufactured by these steps; submersing Ru-containing catalysts for plural times in aqueous solns. and/or organic solvents with different pH and drying, kneading the resulting catalysts with polymer solns., and applying the catalysts on electrode substrates or on electrolyte membranes. All the above steps are carried out in N-containing atmospheric Dissolvable Ru can be preliminary removed from the cells, avoiding its crossover to cathode sides.

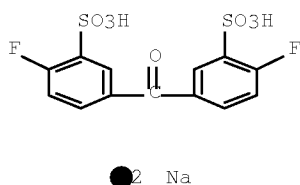
IT 210531-45-6F, Disodium 3,3'-disulfonate-4,4'-
difluorobenzophenone

RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)

(DMFC containing dissoln.-suppressed Ru in anode catalyst
layers and showing stable performance)

RN 210531-45-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt
(1:2) (CA INDEX NAME)

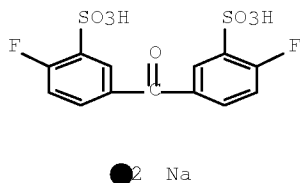


IT 862772-94-9DP, 4,4'-Difluorobenzophenone-disodium
 3,3'-disulfonate-4,4'-difluorobenzophenone-4,4'-(9H-fluoren-9-
 ylidene)bisphenol copolymer, hydrolyzed
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (electrolytes; DMFC containing dissoln.-suppressed Ru in
 anode catalyst layers and showing stable
 performance)
 RN 862772-94-9 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt
 (1:2), polymer with bis(4-fluorophenyl)methanone and
 4,4'-(9H-fluoren-9-ylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 210531-45-6

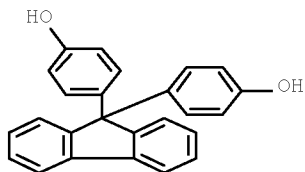
CMF C13 H8 F2 O7 S2 . 2 Na



CM 2

CRN 3236-71-3

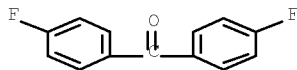
CMF C25 H18 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST direct methanol fuel cell ruthenium catalyst
dissoln prevention; ruthenium anode catalyst crossover
prevention DMFC
- IT Controlled atmospheres
Fuel cell electrolytes
(DMFC containing dissoln.-suppressed Ru in anode catalyst
layers and showing stable performance)
- IT Fluoropolymers, uses
RL: PEP (Physical, engineering or chemical process); TEM
(Technical or engineered material use); PROC (Process); USES
(Uses)
(DMFC containing dissoln.-suppressed Ru in anode catalyst
layers and showing stable performance)
- IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(fluorine- and sulfo-containing, ionomers, cathode
catalysts; DMFC containing dissoln.-suppressed Ru in anode
catalyst layers and showing stable performance)
- IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(fluorine-containing, electrolytes; DMFC containing dissoln.-suppressed
Ru in anode catalyst layers and showing
stable performance)
- IT Fluoropolymers, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(polyketone-, electrolytes; DMFC containing
dissoln.-suppressed Ru in anode catalyst
layers and showing stable performance)
- IT Fuel cells
(polymer electrolyte, direct methanol; DMFC
containing dissoln.-suppressed Ru in anode catalyst
layers and showing stable performance)
- IT Fluoropolymers, uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, cathode
catalysts; DMFC containing dissoln.-suppressed Ru in anode
catalyst layers and showing stable performance)
- IT Ionomers
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(polyoxyalkylenes, fluorine- and
sulfo-containing, cathode catalysts;
DMFC containing dissoln.-suppressed Ru in anode catalyst
layers and showing stable performance)
- IT 210531-45-6P, Disodium 3,3'-disulfonate-4,4'-
difluorobenzophenone
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(DMFC containing dissoln.-suppressed Ru in anode catalyst
layers and showing stable performance)
- IT 67-63-0, 2-Propanol, uses 1310-73-2, Sodium hydroxide, uses
7647-01-0, Hydrochloric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)

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- (DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 345-92-6, 4,4'-Difluorobenzophenone 7647-14-5, Sodium chloride, reactions 7664-93-9, Sulfuric acid, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(Ru- and Pt-supporting, anode catalysts; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(anode catalysts, carbon-supported; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 24937-79-9, Poly(vinylidene fluoride)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(anode components; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 9002-84-0, Polytetrafluoroethylene
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(carbon paper treated with, anodes; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 918656-63-0, LT 1400
RL: TEM (Technical or engineered material use); USES (Uses)
(cathodes; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 862772-94-9DP, 4,4'-Difluorobenzophenone-disodium 3,3'-disulfonate-4,4'-difluorobenzophenone-4,4'-(9H-fluorene-9-ylidene)bisphenol copolymer, hydrolyzed
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrolytes; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 7727-37-9, Nitrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(manufacturing atmospheric; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)
- IT 863658-60-0, TGP-H 60
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(waterproofed, anodes; DMFC containing dissoln.-suppressed Ru in anode catalyst layers and showing stable performance)

L51 ANSWER 9 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2007:223810 HCAPLUS Full-text
DOCUMENT NUMBER: 146:299214
TITLE: Fuel cell catalysts
containing carbonaceous materials, their
films, membrane-
electrode assemblies, and
polymer electrolyte

10/714,394-267960-EIC 1700 SEARCH

INVENTOR(S): fuel cells
Inasaki, Takeshi; Nomura, Kimiatsu
PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 64pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007053086	A	20070301	JP 2006-199261	2006 0721

PRIORITY APPLN. INFO.: JP 2005-211856 A
2005
0721

ED Entered STN: 01 Mar 2007

AB The catalysts contain carbonaceous material supports bonded to polymers bearing solvolysis- and heat-resistant groups, and ionic functional groups via solvolysis- and heat-resistant linkages. The films contain the catalysts, solid electrolytes, and optionally other carbonaceous material-containing catalysts without the polymers. The membrane-electrode assemblies show high catalyst utilization efficiency and good durability.

IT 72355-90-9DP, reaction product with bromopentoxylated carbon black or carbon nanotube 146673-85-0DP, reaction product with bromopentoxylated carbon black or carbon nanotube 342047-78-3DP, reaction product with bromopentoxylated carbon black 342047-79-4DP, reaction product with bromopentoxylated carbon black 927679-95-6DP, reaction product with bromopentoxylated carbon black 927679-96-7DP, reaction product with bromopentoxylated carbon black
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

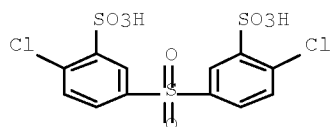
RN 72355-90-9 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 4,4'-(1-methylethylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

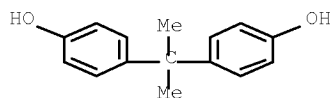


● 2 Na

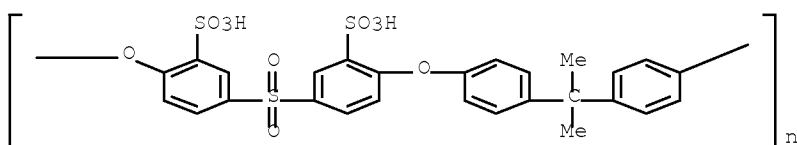
CM 2

10/714,394-267960-EIC 1700 SEARCH

CRN 80-05-7
CMF C15 H16 O2



RN 146673-85-0 HCAPLUS
CN Poly[oxy(2-sulfo-1,4-phenylene)sulfonyl(3-sulfo-1,4-phenylene)oxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene sodium salt (1:2)]
(CA INDEX NAME)

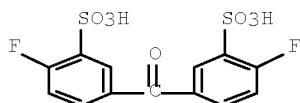


● 2 Na

RN 342047-78-3 HCAPLUS
CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2), polymer with 4,4'-(1-methylethylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 210531-45-6
CMF C13 H8 F2 O7 S2 . 2 Na

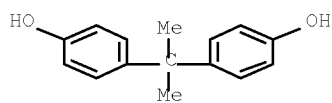


● 2 Na

CM 2

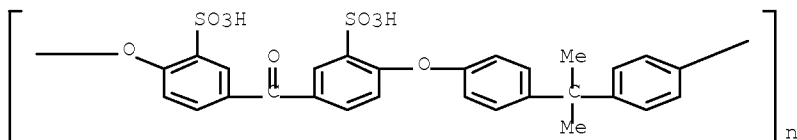
CRN 80-05-7
CMF C15 H16 O2

10/714,394-267960-EIC 1700 SEARCH



RN 342047-79-4 HCAPLUS

CN Poly[oxy(2-sulfo-1,4-phenylene)carbonyl(3-sulfo-1,4-phenylene)oxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene sodium salt (1:2)]
(CA INDEX NAME)



●2 Na

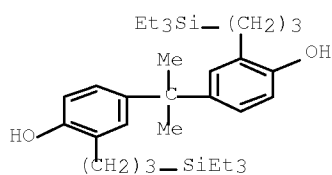
RN 927679-95-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 4,4'-(1-methylethylidene)bis[2-[3-(triethylsilyl)propyl]phenol] (CA INDEX NAME)

CM 1

CRN 917383-95-0

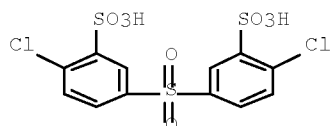
CMF C33 H56 O2 Si2



CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

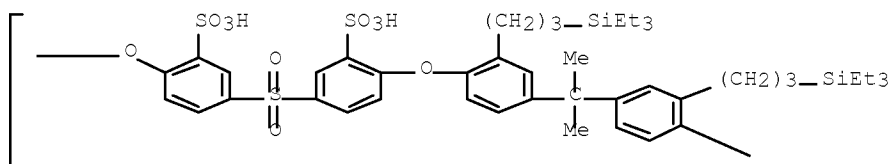


●2 Na

10/714,394-267960-EIC 1700 SEARCH

RN 927679-96-7 HCAPLUS
 CN Poly[oxy(2-sulfo-1,4-phenylene)sulfonyl(3-sulfo-1,4-phenylene)oxy[2-[3-(triethylsilyl)propyl]-1,4-phenylene](1-methylethylidene)[3-[3-(triethylsilyl)propyl]-1,4-phenylene] sodium salt (1:2)] (CA INDEX NAME)

PAGE 1-A

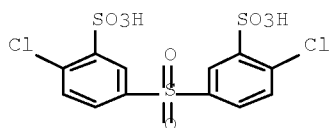


● 2 Na

PAGE 1-B

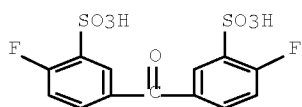


IT 51698-33-0P 210531-45-6P, 3,3'-Disulfo-4,4'-difluorobenzophenone disodium salt
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
 RN 51698-33-0 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2)] (CA INDEX NAME)



● 2 Na

RN 210531-45-6 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, sodium salt (1:2)] (CA INDEX NAME)



● 2 Na

IT 927675-72-7F

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrolyte membrane; catalyst films
containing carbonaceous materials with ionic functional groups for
polymer electrolyte fuel
cells)

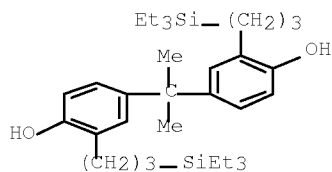
RN 927675-72-7 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt
(1:2), polymer with 4,4'-(1-methylethylidene)bis[2-[3-
(triethylsilyl)propyl]phenol] and 1,1'-sulfonylbis[4-
chlorobenzene] (CA INDEX NAME)

CM 1

CRN 917383-95-0

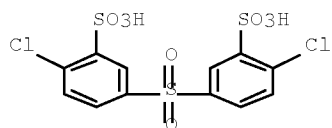
CMF C33 H56 O2 Si2



CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

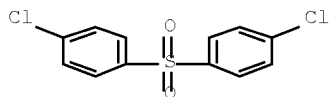


● 2 Na

CM 3

CRN 80-07-9

CMF C12 H8 Cl2 O2 S



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST ionic polymer carbonaceous support fuel cell
catalyst; fuel cell catalyst heat solvolysis
resistance
- IT Carbon black, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(Carbon ECP, Denka Black HS 100, reaction products with sulfo-containing polymers; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT Nanotubes
(carbon, multilayer, bromo derivs., reaction products with sulfo-containing polyether-polysulfones; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT Fuel cell electrodes
Fuel cell electrolytes
(catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT Catalysts
(electrocatalysts; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, protonic conductors; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT Polysulfones, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, chloromethylated, reaction product with sodium mercaptopropanesulfonate; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT Polysulfones, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyether-, polystyrene-, graft, sulfo-containing, reaction products with carbon black; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT Polysulfones, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyether-, sulfo-containing, reaction products with carbon black or carbon nanotubes; catalyst films

10/714,394-267960-EIC 1700 SEARCH

containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Polyketones

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(polyether-, sulfo-containing, reaction products with carbon black; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Polyethers, uses

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(polyketone-, sulfo-containing, reaction products with carbon black; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Fuel cells

(polymer electrolyte; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Fluoropolymers, uses

RL: CAT (Catalyst use); USES (Uses)

(polyoxyalkylene-, sulfo-containing, ionomers, protonic conductors; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Ionomers

RL: CAT (Catalyst use); USES (Uses)

(polyoxyalkylenes, fluorine- and sulfo-containing, protonic conductors; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Polyethers, uses

RL: CAT (Catalyst use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfone-, chloromethylated, reaction product with sodium mercaptopropanesulfonate; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Polyethers, uses

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(polysulfone-, polystyrene-, graft, sulfo-containing, reaction products with carbon black; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Polyethers, uses

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(polysulfone-, sulfo-containing, reaction products with carbon black or carbon nanotubes; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

IT Polysulfones, uses

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(sulfo- and triethylsilyl-containing; catalyst films

10/714,394-267960-EIC 1700 SEARCH

containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

- IT 111-24-ODP, 1,5-Dibromopentane, reaction product with carbon black and sulfo-containing polyether-polysulfone 3229-00-3DP, Pentaerythrityl tetrabromide, reaction product with carbon black and sulfo- and triethylsilyl-containing polyether-polysulfone 7440-06-4P, Platinum, uses 25135-51-7DP, reaction product with carbon black bromo derivative, chloromethylated, graft polymer with lithium sulfopropylstyrene and trimethylsilyloxystyrene, hydrolyzed 25154-01-2DP, reaction product with carbon black bromo derivative, chloromethylated, graft polymer with lithium sulfopropylstyrene and trimethylsilyloxystyrene, hydrolyzed 72355-90-9DP, reaction product with bromopentoxylated carbon black or carbon nanotube 146673-85-0DP, reaction product with bromopentoxylated carbon black or carbon nanotube 342047-78-3DP, reaction product with bromopentoxylated carbon black 342047-79-4DP, reaction product with bromopentoxylated carbon black 904911-37-1DP, graft copolymer with carbon black-bound chloromethylated polyether-polysulfone and trimethylsilylpropylstyrene, hydrolyzed 927679-95-6DP, reaction product with bromopentoxylated carbon black 927679-96-7DP, reaction product with bromopentoxylated carbon black 927679-98-9DP, graft copolymer with carbon black-bound chloromethylated polyether-polysulfone and lithium sulfopropylstyrene, hydrolyzed 927679-99-0DP, reaction product with carbon black
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 107-30-2DP, Chloromethyl methyl ether, reaction product with carbon black-bound polyether-polysulfone, graft polymer with lithium sulfopropylstyrene and trimethylsilylpropylstyrene, hydrolyzed
RL: CAT (Catalyst use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 51698-33-0P 210531-45-6P, 3,3'-Disulfo-4,4'-difluorobenzophenone disodium salt 904911-37-1P 917383-95-0P 927679-98-9P 927679-99-0P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 17636-10-1DP, Sodium 3-mercapto-1-propanesulfonate, reaction product with chloromethylated polyether-polysulfone 25135-51-7DP, chloromethylated, reaction product with sodium mercaptopropanesulfonate 927675-72-7P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrolyte membrane; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 264217-10-9, Nafion 1135
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte membrane; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

10/714,394-267960-EIC 1700 SEARCH

- IT 1120-71-4, Propanesultone 2628-16-2, 4-Vinylphenyl acetate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of (sulfopropoxy)styrene Li salt from; catalyst
 films containing carbonaceous materials with ionic
 functional groups for polymer electrolyte
 fuel cells)
- IT 617-86-7, Triethylsilane 1745-89-7, 2,2'-Diallylbisphenol A
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of bis(triethylsilylpropyl)bisphenol A from; catalyst
 films containing carbonaceous materials with ionic
 functional groups for polymer electrolyte
 fuel cells)
- IT 80-07-9, 4,4'-Dichlorodiphenyl sulfone
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of disulfodichlorodiphenylsulfone disodium salt from;
 catalyst films containing carbonaceous materials with
 ionic functional groups for polymer
 electrolyte fuel cells)
- IT 345-92-6, 4,4'-Difluorobenzophenone
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of disulfodifluorobenzophenone disodium salt from;
 catalyst films containing carbonaceous materials with
 ionic functional groups for polymer
 electrolyte fuel cells)
- IT 2344-83-4, (3-Chloropropyl)trimethylsilane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of trimethylsilylpropyloxystyrene from; catalyst
 films containing carbonaceous materials with ionic
 functional groups for polymer electrolyte
 fuel cells)
- IT 7440-44-ODP, Carbon, bromo derivative, reaction product with
 sulfo-containing polyether-polysulfone
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (nanotubes, multilayer; catalyst films
 containing carbonaceous materials with ionic functional groups for
 polymer electrolyte fuel
 cells)

L51 ANSWER 10 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:223806 HCAPLUS Full-text
 DOCUMENT NUMBER: 146:277710
 TITLE: Fuel cell catalysts
 containing carbonaceous materials, their
 films, membrane-
 electrode assemblies, and
 polymer electrolyte
 fuel cells

INVENTOR(S): Inasaki, Takeshi; Nomura, Kimiatsu
 PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 38pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent
 LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2007053082	A	20070301	JP 2006-194374	2006 0714
PRIORITY APPLN. INFO.:			JP 2005-211857	A 2005 0721

10/714,394-267960-EIC 1700 SEARCH

ED Entered STN: 01 Mar 2007

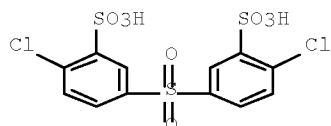
AB The catalysts contain carbonaceous material supports bonded to ionic functional groups via solvolysis- and heat-resistant linkages. The films contain the catalysts, solid electrolytes, and optionally other carbonaceous material-containing catalysts without ionic functional groups. The membrane-electrode assemblies show high catalyst utilization efficiency and good durability.

IT 51698-33-0P, 3,3'-Disulfo-4,4'-dichlorodiphenyl sulfone disodium salt

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

RN 51698-33-0 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2) (CA INDEX NAME)



● 2 Na

IT 927675-72-7P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(protonic conductor; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

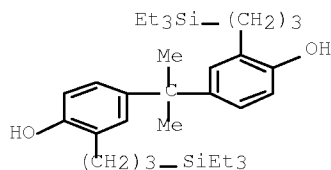
RN 927675-72-7 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 4,4'-(1-methylethylidene)bis[2-[3-(triethylsilyl)propyl]phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (CA INDEX NAME)

CM 1

CRN 917383-95-0

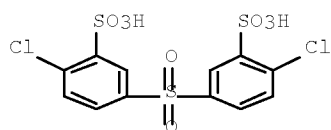
CMF C33 H56 O2 Si2



CM 2

CRN 51698-33-0

CMF C12 H8 Cl2 O8 S3 . 2 Na

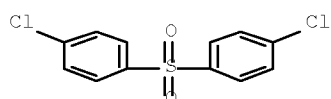


●2 Na

CM 3

CRN 80-07-9

CMF C12 H8 Cl2 O2 S



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST ionic carbonaceous support fuel cell catalyst;
fuel cell catalyst heat solvolysis resistance
- IT Carbon black, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(Ketjenblack EC-P, Denka Black HS 100, ionic functional
group-bonded; catalyst films containing carbonaceous
materials with ionic functional groups for polymer
electrolyte fuel cells)
- IT Nanotubes
(carbon, multilayer, reaction product with
(sulfopropoxy)aniline; catalyst films containing
carbonaceous materials with ionic functional groups for
polymer electrolyte fuel
cells)
- IT Fuel cell electrodes
Fuel cell electrolytes
(catalyst films containing carbonaceous materials with
ionic functional groups for polymer
electrolyte fuel cells)
- IT Catalysts
(electrocatalysts; catalyst films containing carbonaceous
materials with ionic functional groups for polymer
electrolyte fuel cells)
- IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, protonic
conductors; catalyst films containing
carbonaceous materials with ionic functional groups for
polymer electrolyte fuel
cells)
- IT Polysulfones, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES
(Uses)
(polyether-, chloromethylated, reaction product with sodium
mercaptopropanesulfonate; catalyst films containing

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carbonaceous materials with ionic functional groups for
polymer electrolyte fuel
cells)

- IT Polysulfones, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(polyether-, polystyrene-, graft, sulfo-containing; catalyst
films containing carbonaceous materials with ionic
functional groups for polymer electrolyte
fuel cells)
- IT Fuel cells
(polymer electrolyte; catalyst
films containing carbonaceous materials with ionic
functional groups for polymer electrolyte
fuel cells)
- IT Fluoropolymers, uses
RL: CAT (Catalyst use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, protonic
conductors; catalyst films containing
carbonaceous materials with ionic functional groups for
polymer electrolyte fuel
cells)
- IT Ionomers
RL: CAT (Catalyst use); USES (Uses)
(polyoxyalkylenes, fluorine- and
sulfo-containing, protonic conductors; catalyst
films containing carbonaceous materials with ionic
functional groups for polymer electrolyte
fuel cells)
- IT Polyethers, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES
(Uses)
(polysulfone-, chloromethylated, reaction product with sodium
mercaptopropanesulfonate; catalyst films containing
carbonaceous materials with ionic functional groups for
polymer electrolyte fuel
cells)
- IT Polyethers, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(polysulfone-, polystyrene-, graft, sulfo-containing; catalyst
films containing carbonaceous materials with ionic
functional groups for polymer electrolyte
fuel cells)
- IT Polysulfones, uses
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(sulfo- and triethylsilyl-containing; catalyst films
containing carbonaceous materials with ionic functional groups for
polymer electrolyte fuel
cells)
- IT 108-73-6DP, 1,3,5-Trihydroxybenzene, reaction product with
bromopentyl-bound carbon black and propanesultone
111-24-ODP, 1,5-Dibromopentane, reaction product with
carbon black, sulfonated 1120-71-4DP, Propanesultone,
reaction product with carbon black 3229-00-3DP,
Pentaerythrityl tetrabromide, reaction product with carbon
black, sulfonated 3542-44-7DP, Sodium 3-hydroxypropanesulfonate,
reaction products with carbon black 7440-06-4P,
Platinum, uses 93632-20-3DP, reaction products with carbon
nanotube or carbon black
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(catalyst films containing carbonaceous
materials with ionic functional groups for polymer
electrolyte fuel cells)

10/714,394-267960-EIC 1700 SEARCH

- IT 51698-33-0P, 3,3'-Disulfo-4,4'-dichlorodiphenyl sulfone disodium salt 93632-20-3P, 4-(3-Sulfopropoxy)aniline 904911-37-1P, 4-(3-Sulfopropoxy)styrene lithium salt 917383-95-0P, 3,3'-Bis(triethylsilylpropyl)bisphenol A
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 264217-10-9, Nafion 1135
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte membrane; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 1120-71-4, Propanesultone 2628-16-2, 4-Vinylphenyl acetate
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of (sulfopropoxy)styrene Li salt from; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 617-86-7, Triethylsilane 1745-89-7, 2,2'-Diallylbisphenol A
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of bis(triethylsilylpropyl)bisphenol A from; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 80-07-9, 4,4'-Dichlorodiphenyl sulfone
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of disulfodichlorodiphenylsulfone disodium salt from; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 103-90-2, p-Acetamidophenol
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of ionic compound from; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 7440-44-ODP, Carbon, reaction products with (sulfopropoxy)aniline
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(nanotubes, multilayer; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 107-30-2DP, Chloromethyl methyl ether, reaction products with polyether-polysulfone and sodium mercaptosulfonate 17636-10-1DP, Sodium 3-mercapto-1-propanesulfonate, reaction products with chloromethylated polyether-polysulfone 25135-51-7DP, chloromethylated, reaction products with sodium mercaptopropanesulfonate
RL: CAT (Catalyst use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(protonic conductor and electrolyte membrane; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)
- IT 904911-37-1DP, graft copolymer with chloromethylated polyether-polysulfone, hydrolyzed 927675-72-7P
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(protonic conductor; catalyst films containing carbonaceous materials with ionic functional groups for polymer electrolyte fuel cells)

10/714,394-267960-EIC 1700 SEARCH

cells)

L51 ANSWER 11 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2007:197669 HCAPLUS Full-text
 DOCUMENT NUMBER: 146:255346
 TITLE: Manufacture of membrane-electrode assembly (MEA) of polymer-electrolyte
 INVENTOR(S): Komatsu, Satoshi; Otsuki, Toshitaka; Fukuda, Kaoru; Takahashi, Ryoichiro; Shinkai, Hiroshi
 PATENT ASSIGNEE(S): Jsr Ltd., Japan; Honda Motor Co., Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 18pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2007048557	A	20070222	JP 2005-230722	2005 0809

PRIORITY APPLN. INFO.: JP 2005-230722
 2005
 0809

ED Entered STN: 22 Feb 2007

AB The manufacture includes steps of (1) soaking an aromatic polymer electrolyte membrane in a solvent, (2) applying a catalyst paste containing the polymer electrolyte on the membrane containing 20-60% of the solvent, and drying to give a catalyst layer. Alternatively, first catalyst layer is previously formed on the aromatic polymer electrolyte membrane prior to soaking in a solvent, and then second catalyst layer is formed in the same manner as that above claimed. The solvent may be aqueous C₆ alc., or water. The aromatic electrolyte may be sulfo-containing poly(alkyl)arylenes. The electrolyte membranes have uniform thickness and show high adhesion to the electrode layers, thereby fuel cells employing the MEA achieve high power generation efficiency.

IT 908342-30-3DP, hydrolyzed

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)

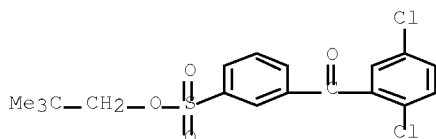
RN 908342-30-3 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with 1,1'-(1,3-phenylene)bis[1-(4-chlorophenyl)methanone] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 847972-43-4

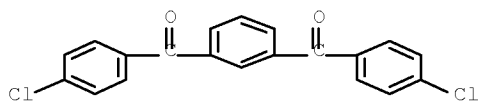
CMF C18 H18 Cl2 O4 S



CM 2

CRN 22198-44-3

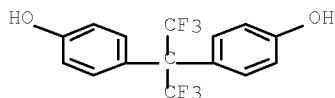
CMF C20 H12 Cl2 O2



CM 3

CRN 1478-61-1

CMF C15 H10 F6 O2



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST fuel cell electrolyte arom
polymer membrane soaking solvent;
polymer electrolyte fuel cell
electrode catalyst paste coating; sulfo arom
fluoropolymer polyether polyketone fuel cell
electrolyte
- IT Polyelectrolytes
(aromatic; manufacture of membrane-electrode
assembly of polymer-electrolyte
fuel cells by using aromatic polymers)
- IT Carbon black, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material
use); USES (Uses)
(catalyst supports in electrodes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Fuel cell electrodes
(coating of catalyst paste; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Fuel cell electrolytes
(manufacture of membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Coating process
(pastes, in forming electrodes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Polyketones
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(polyether-, fluorine-containing, electrolytes; manufacture of

10/714,394-267960-EIC 1700 SEARCH

- membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Fluoropolymers, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(polyether-polyketone-, electrolytes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Polyethers, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(polyketone-, fluorine-containing, electrolytes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Fuel cells
(polymer electrolyte; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material
use); USES (Uses)
(catalysts in electrodes; manufacture of membrane
-electrode assembly of polymer-
electrolyte fuel cells by using
aromatic polymers)
- IT 390761-63-4, TEC 10E50E
RL: CAT (Catalyst use); TEM (Technical or engineered material
use); USES (Uses)
(catalysts supported on catalysts, in electrodes;
manufacture of membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT 908342-30-3DP, hydrolyzed
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(electrolytes; manufacture of membrane-electrode
assembly of polymer-electrolyte
fuel cells by using aromatic polymers)
- IT 125776-08-1P 908342-29-0P, 1,3,-Bis(4-chlorobenzoyl)benzene-2,2-
bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane
copolymer
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(precursor of polymer electrolytes; manufacture
of membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT 67-56-1, Methanol, uses 872-50-4, N-Methylpyrrolidone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvents in dope casting of polymer membranes;
manufacture of membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)

L51 ANSWER 12 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:197668 HCAPLUS Full-text

DOCUMENT NUMBER: 146:255345

TITLE: Manufacture of membrane-
electrode assembly (MEA) of
polymer-electrolyte
fuel cellsINVENTOR(S): Komatsu, Satoshi; Otsuki, Toshitaka; Fukuda,
Kaoru; Takahashi, Ryoichiro; Shinkai, Hiroshi

10/714,394-267960-EIC 1700 SEARCH

PATENT ASSIGNEE(S): Jsr Ltd., Japan; Honda Motor Co., Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2007048556	A	20070222	JP 2005-230721	2005 0809

PRIORITY APPLN. INFO.: JP 2005-230721
 2005
 0809

ED Entered STN: 22 Feb 2007

AB The manufacture includes steps of (1) forming an aromatic polymer electrolyte membrane on a temporary support, (2) forming first catalyst layer on the membrane by applying and drying a paste containing catalyst-carrying carbon, aromatic polymer electrolyte, pore former, and solvent, (3) peeling the support off the membrane, (4) forming second catalyst layer in the same manner as that of 2, and (5) removing solvents from the electrolyte membranes. The aromatic electrolyte may be sulfo-containing poly(alkyl)arylenes. The electrolyte membrane may be formed by dope casting process. The electrolyte membranes show high adhesion to the electrodes, thereby fuel cells employing the MEA achieve high power generation efficiency.

IT 855602-04-9DP, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, free acids

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)

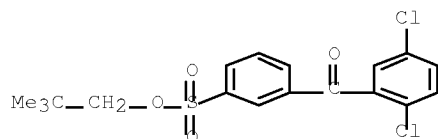
RN 855602-04-9 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with 2,6-dichlorobenzonitrile and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 847972-43-4

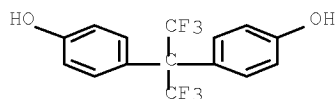
CMF C18 H18 Cl2 O4 S



CM 2

CRN 1478-61-1

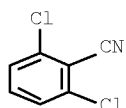
CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST fuel cell electrolyte arom
polymer membrane electrode assembly;
polymer electrolyte fuel cell
dope casting solvent removal; electrode catalyst paste
coating polymer electrolyte
fuel cell; sulfo arom fluoropolymer
polyether fuel cell electrolyte
- IT Carbon fibers, uses
RL: NUU (Other use, unclassified); USES (Uses)
(VGCF, pore formers in forming electrodes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Polyelectrolytes
(aromatic; manufacture of membrane-electrode
assembly of polymer-electrolyte
fuel cells by using aromatic polymers)
- IT Carbon black, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material
use); USES (Uses)
(catalyst supports in electrodes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Fuel cell electrodes
(coating of catalyst paste; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Polyethers, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(fluorine-containing, electrolytes; manufacture of membrane-
electrode assembly of polymer-
electrolyte fuel cells by using
aromatic polymers)
- IT Fuel cell electrolytes
(manufacture of membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Coating process

10/714,394-267960-EIC 1700 SEARCH

- (pastes, in forming electrodes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT Fluoropolymers, preparation
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (polyether-, electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT Fuel cells
 (polymer electrolyte; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 7440-06-4, Platinum, uses
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (catalysts in electrodes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 390761-63-4, TEC 10E50E
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (catalysts supported on catalysts, in electrodes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 855602-04-9DP, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, free acids
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 193410-36-5P, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile copolymer
 193410-37-6P, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile copolymer, sru
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (precursor of electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 67-56-1, Methanol, uses 872-50-4, N-Methylpyrrolidone, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (solvents in dope casting of polymer membranes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)

L51 ANSWER 13 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:197666 HCAPLUS Full-text

DOCUMENT NUMBER: 146:255343

TITLE: Manufacture of membrane-electrode assembly (MEA) of polymer-electrolyte fuel cells

INVENTOR(S): Komatsu, Satoshi; Otsuki, Toshitaka; Fukuda, Kaoru; Takahashi, Ryoichiro; Shinkai, Hiroshi

10/714,394-267960-EIC 1700 SEARCH

PATENT ASSIGNEE(S): Jsr Ltd., Japan; Honda Motor Co., Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 15pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2007048555	A	20070222	JP 2005-230720	2005 0809

PRIORITY APPLN. INFO.: JP 2005-230720
 2005
 0809

ED Entered STN: 22 Feb 2007

AB The manufacture includes steps of (1) forming a solid polymer electrolyte membrane on a temporary support by dope casting process, (2) forming first catalyst layer on the membrane by applying and drying a paste containing catalyst-carrying carbon, aromatic polymer electrolyte, pore former, and solvent, (3) peeling the support off the membrane, and (4) forming second catalyst layer in the same manner as that of 2. The aromatic electrolyte may be sulfo-containing poly(alkyl)arylenes. The electrolyte membranes show high adhesion to the electrode layers, thereby fuel cells employing the MEA achieve high power generation efficiency.

IT 855602-04-95P, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, free acids

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)

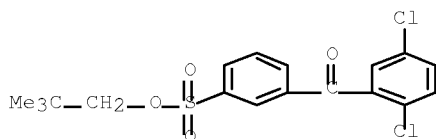
RN 855602-04-9 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with 2,6-dichlorobenzonitrile and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 847972-43-4

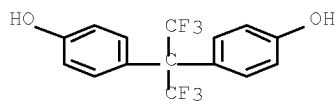
CMF C18 H18 Cl2 O4 S



CM 2

CRN 1478-61-1

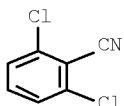
CMF C15 H10 F6 O2



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST fuel cell electrolyte arom
polymer membrane dope casting; polymer
electrolyte fuel cell
electrode catalyst paste coating; sulfo arom
fluoropolymer polyether fuel cell
electrolyte
- IT Carbon fibers, uses
RL: NUU (Other use, unclassified); USES (Uses)
(VGCF, pore formers in forming electrodes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Casting of polymeric materials
(aromatic polymer electrolytes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Polyelectrolytes
(aromatic; manufacture of membrane-electrode
assembly of polymer-electrolyte
fuel cells by using aromatic polymers)
- IT Carbon black, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material
use); USES (Uses)
(catalyst supports in electrodes; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Fuel cell electrodes
(coating of catalyst paste; manufacture of
membrane-electrode assembly of
polymer-electrolyte fuel
cells by using aromatic polymers)
- IT Polyethers, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(fluorine-containing, electrolytes; manufacture of membrane-
electrode assembly of polymer-
electrolyte fuel cells by using
aromatic polymers)
- IT Fuel cell electrolytes

10/714,394-267960-EIC 1700 SEARCH

- (manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT Coating process
(pastes, in forming electrodes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT Fluoropolymers, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(polyether-, electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT Fuel cells
(polymer electrolyte; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(catalysts in electrodes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 390761-63-4, TEC 10E50E
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(catalysts supported on catalysts, in electrodes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 855602-04-9DP, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, free acids
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 193410-36-5P, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile copolymer
193410-37-6P, 2,2-Bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,6-dichlorobenzonitrile copolymer, sru
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(precursor of electrolytes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)
- IT 67-56-1, Methanol, uses 872-50-4, N-Methylpyrrolidone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvents in dope casting of polymer membranes; manufacture of membrane-electrode assembly of polymer-electrolyte fuel cells by using aromatic polymers)

L51 ANSWER 14 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2007:63572 HCAPLUS Full-text
DOCUMENT NUMBER: 146:166444
TITLE: Membrane-electrode assemblies for solid polymer fuel

10/714,394-267960-EIC 1700 SEARCH

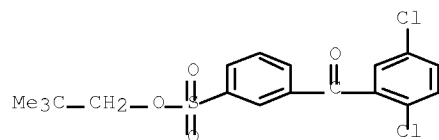
cells
 INVENTOR(S): Kawai, Junji; Ohtsuki, Toshihiro; Yamamoto,
 Takanobu; Komatsu, Satoshi; Fukuda, Kaoru;
 Takahashi, Ryoichiro; Shinkai, Hiroshi
 PATENT ASSIGNEE(S): Jsr Corporation, Japan; Honda Motor Co., Ltd.
 SOURCE: U.S. Pat. Appl. Publ., 15pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070015041	A1	20070118	US 2006-485618	2006 0713
JP 2007026819	A	20070201	JP 2005-205658	2005 0714
PRIORITY APPLN. INFO.:			JP 2005-205658	A 2005 0714

ED Entered STN: 19 Jan 2007
 AB Membrane-electrode assemblies are provided which have polymer electrolyte membranes capable of maintaining an adequately wet condition even at high temps. and have superior generating properties. The membrane-electrode assembly includes an ion exchange resin membrane, an anode catalyst layer including catalyst -supported carbon and an ion exchange resin, and a cathode catalyst layer including catalyst-supported carbon and an ion exchange resin, the anode catalyst layer including a binder component of which the ion exchange capacity is higher than that of a binder component in the cathode catalyst layer, and/or the anode catalyst layer including an ion exchange resin layer of which the water content is higher than that of anion exchange resin layer of the cathode catalyst layer.
 IT 7440-44-0, Carbon, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (catalyst-supported; membrane-electrode assemblies for solid polymer fuel cells)
 RN 7440-44-0 HCAPLUS
 CN Carbon (CA INDEX NAME)

c

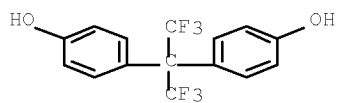
IT 897014-65-2P 920267-69-2P
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (membrane-electrode assemblies for solid polymer fuel cells)
 RN 897014-65-2 HCAPLUS
 CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-chlorophenyl)methanone, 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)
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 CRN 847972-43-4
 CMF C18 H18 Cl2 O4 S



CM 2

CRN 1478-61-1

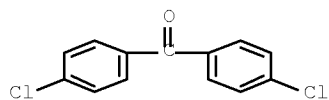
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

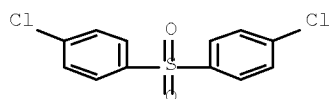
CMF C13 H8 Cl2 O



CM 4

CRN 80-07-9

CMF C12 H8 Cl2 O2 S



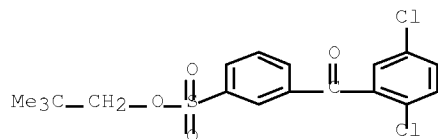
RN 920267-69-2 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl
 ester, polymer with 2,6-dichlorobenzonitrile and
 4,4'-(9H-fluoren-9-ylidene)bis[phenol] (CA INDEX NAME)

CM 1

CRN 847972-43-4

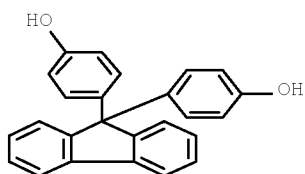
CMF C18 H18 Cl2 O4 S



CM 2

CRN 3236-71-3

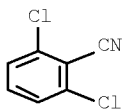
CMF C25 H18 O2



CM 3

CRN 1194-65-6

CMF C7 H3 Cl2 N



INCL 429042000; 429044000; 429030000; 429033000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST membrane electrode assembly solid polymer
 fuel cell
 IT Fuel cell electrodes
 Fuel cell electrolytes
 Ion exchangers
 (membrane-electrode assemblies for solid
 polymer fuel cells)
 IT Fuel cells
 (polymer electrolyte; membrane-
 electrode assemblies for solid polymer fuel
 cells)
 IT 7440-44-0, Carbon, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (catalyst-supported; membrane-
 electrode assemblies for solid polymer fuel
 cells)
 IT 7440-06-4, Platinum, uses
 RL: CAT (Catalyst use); USES (Uses)
 (membrane-electrode assemblies for solid

10/714,394-267960-EIC 1700 SEARCH

polymer fuel cells)
 IT 911123-33-6P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (membrane-electrode assemblies for solid
 polymer fuel cells)
 IT 128116-47-2P 897014-65-2P 920267-69-2P
 RL: SPN (Synthetic preparation); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (membrane-electrode assemblies for solid
 polymer fuel cells)
 IT 194739-90-7, YTZ
 RL: TEM (Technical or engineered material use); USES (Uses)
 (membrane-electrode assemblies for solid
 polymer fuel cells)

L51 ANSWER 15 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:59243 HCAPLUS Full-text

DOCUMENT NUMBER: 146:166415

TITLE: Solid polymer electrolytes
 , proton conducting films,
 electrode electrolytes,
 electrode pastes, and membrane
 electrode assemblies

INVENTOR(S): Okada, Takashi; Yamakawa, Yoshitaka; Otsuki,
 Toshitaka; Goto, Kohei; Fukuda, Kaoru;
 Shinkai, Hiroshi; Takahashi, Ryoichiro

PATENT ASSIGNEE(S): JSR Ltd., Japan; Honda Motor Co., Ltd.

SOURCE: Jpn. Kokai Tokkyo Koho, 24pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

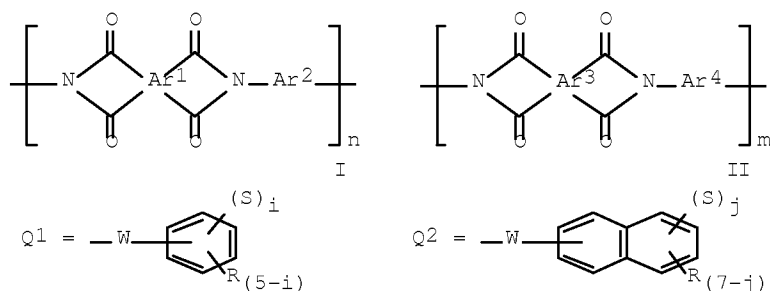
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2007012310	A	20070118	JP 2005-188447	2005 0628
PRIORITY APPLN. INFO.:			JP 2005-188447	2005 0628

ED Entered STN: 18 Jan 2007

GI



10/714,394-267960-EIC 1700 SEARCH

AB Solid polymer electrolytes comprising copolymers containing protonic acid group-containing structural repeating unit I and protonic acid group-free structural repeating unit II (Ar1, Ar3 = tetravalent organic group containing aromatic ring; Ar2, AR4 = bivalent organic group containing C6-25 aromatic ring; Ar1 and/or Ar2 = Q1, Q2; W = CO, SO2, SO, CONH, CO2 (CF2)k, C(CF3)2; S = protonic acid group; R = H, F, (fluoro)alkyl, aryl; i = integer of 1-5; j = integer of 1-7; k = integer of 1-10; n, m = pos. integer). Protonic conducting films and electrode electrolytes comprising the electrolytes, electrode pastes containing the electrode electrolytes, C-supported catalysts, and solvent, and membrane electrode assemblies including the electrolytes as the protonic conductors and/or the electrodes are also claimed. The electrolytes are thermally and dimensionally stable.

IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst support in electrode paste;
 sulfonated F-containing polyimide electrolytes for fuel
 cells)

RN 7440-44-0 HCAPLUS
 CN Carbon (CA INDEX NAME)

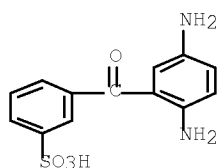
C

IT 919836-83-2P 919836-84-3P 919836-86-5P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfonated F-containing polyimide electrolytes for fuel
 cells)

RN 919836-83-2 HCAPLUS
 CN Benzenesulfonic acid, 3-(2,5-diaminobenzoyl)-, polymer with 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone and 4,4'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(4,1-phenyleneoxy)]bis[benzenamine], block (CA INDEX NAME)

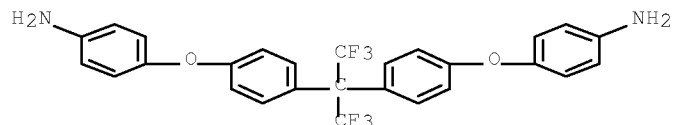
CM 1

CRN 919836-82-1
 CMF C13 H12 N2 O4 S



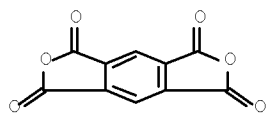
CM 2

CRN 69563-88-8
 CMF C27 H20 F6 N2 O2



CM 3

CRN 89-32-7
 CMF C10 H2 O6

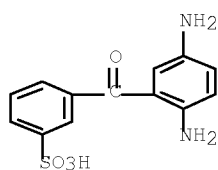


RN 919836-84-3 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-diaminobenzoyl)-, polymer with
 [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone and
 4,4'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(4,1-
 phenyleneoxy)]bis[benzenamine], block (CA INDEX NAME)

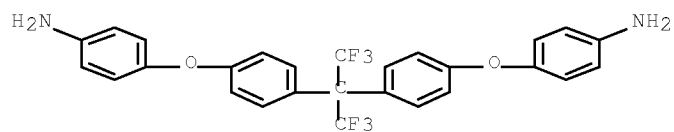
CM 1

CRN 919836-82-1
 CMF C13 H12 N2 O4 S



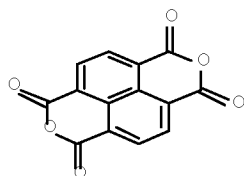
CM 2

CRN 69563-88-8
 CMF C27 H20 F6 N2 O2



CM 3

CRN 81-30-1
 CMF C14 H4 O6



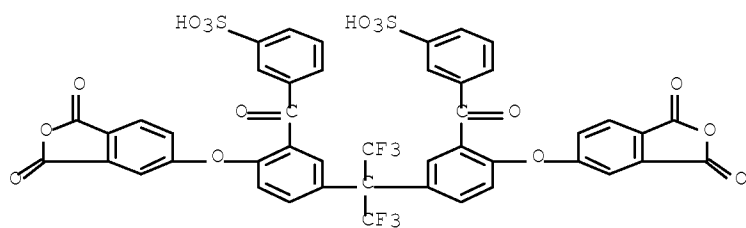
RN 919836-86-5 HCAPLUS

CN Benzenesulfonic acid, 3,3'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[[6-[(1,3-dihydro-1,3-dioxo-5-isobenzofuranyl)oxy]-3,1-phenylene]carbonyl]]bis-, polymer with 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone and 4,4'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(4,1-phenyleneoxy)]bis[benzenamine], block (CA INDEX NAME)

CM 1

CRN 919836-85-4

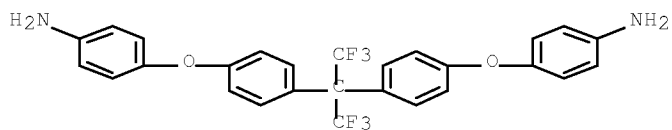
CMF C45 H22 F6 O16 S2



CM 2

CRN 69563-88-8

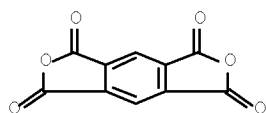
CMF C27 H20 F6 N2 O2



CM 3

CRN 89-32-7

CMF C10 H2 O6



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38

ST sulfonated polyimide polyelectrolyte fuel cell
 ; polyimide polymer electrolyte fuel cell

IT Polyimides, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (fluorine-contg, block, sulfonated; sulfonated F-containing polyimide electrolytes for fuel cells)

IT Fuel cell electrodes
 (membrane electrode assemblies; sulfonated F-containing polyimide electrolytes for fuel cells)

IT Fluoropolymers, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyimide-, block, sulfonated; sulfonated F-containing polyimide electrolytes for fuel cells)

IT Fuel cells
 (polymer electrolyte; sulfonated F-containing polyimide electrolytes for fuel cells)

IT Ionic conductors
 (proton; sulfonated F-containing polyimide electrolytes for fuel cells)

IT Paste electrodes
 Polyelectrolytes
 (sulfonated F-containing polyimide electrolytes for fuel cells)

IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst support in electrode paste; sulfonated F-containing polyimide electrolytes for fuel cells)

IT 919836-83-2P 919836-84-3P 919836-86-5P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfonated F-containing polyimide electrolytes for fuel cells)

L51 ANSWER 16 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:1066085 HCAPLUS Full-text

DOCUMENT NUMBER: 145:380471

TITLE: Electrode catalyst layers
 for membrane-electrode
 assemblies (MEA) of polymer-
 electrolyte fuel
 cells

INVENTOR(S): Kawai, Junji; Otsuki, Toshitaka; Fukuda,
 Kaoru; Takahashi, Ryoichiro; Shinkai, Hiroshi

PATENT ASSIGNEE(S): JSR Ltd., Japan; Honda Motor Co., Ltd.

SOURCE: Jpn. Kokai Tokkyo Koho, 19pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

10/714,394-267960-EIC 1700 SEARCH

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006278233	A	20061012	JP 2005-98249	2005 0330

PRIORITY APPLN. INFO.:

JP 2005-98249

2005
0330

ED Entered STN: 13 Oct 2006

AB The catalyst layers contain catalysts-carrying carbon particles, aromatic polymers bearing ionic conductive components, and elec. conductive fillers. Preferable structure of the polymers are also given. In manufacture of the catalyst layers, pastes containing the carbon particles, the aromatic polymers, and casting solvents are cast on substrates to form thin films which are then brought in contact with solns. containing poor solvents showing compatibility with the casting solvents so as to remove the casting solvents and simultaneously form pores. The catalyst layers show good balance between gas-diffusion or water-discharging characteristics, and electron/proton conductivity

IT 897014-65-2DF, 2,2-Bis(4-hydroxyphenyl)hexafluoropropane-4,4'-dichlorobenzophenone-4,4'-dichlorodiphenylsulfone-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, hydrolyzed
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
 (porous layer; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)

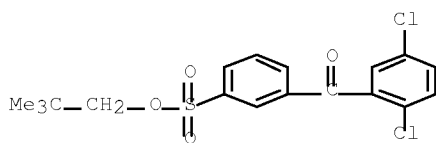
RN 897014-65-2 HCAPLUS

CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-chlorophenyl)methanone, 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 847972-43-4

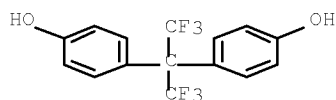
CMF C18 H18 Cl2 O4 S



CM 2

CRN 1478-61-1

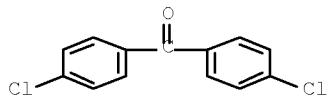
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

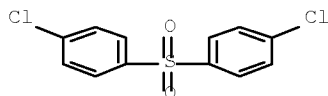
CMF C13 H8 Cl2 O



CM 4

CRN 80-07-9

CMF C12 H8 Cl2 O2 S



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
- ST fuel cell electrode ionic
conductor arom polymer; fluoropolymer polyether polyketone
polysulfone electrode catalyst layer
fuel cell; carbon conductor filler arom polymer
electrode fuel cell
- IT Carbon black, uses
RL: DEV (Device component use); MOA (Modifier or additive use);
USES (Uses)
(Carbon black 2300, elec. conductive filler; in
electrode catalyst layer containing aromatic polymer
and conductive filler for polymer-electrolyte
fuel cell)
- IT Carbon fibers, uses
RL: DEV (Device component use); MOA (Modifier or additive use);
USES (Uses)
(VGCF, elec. conductive filler; in electrode catalyst
layer containing aromatic polymer and conductive filler for
polymer-electrolyte fuel
cell)
- IT Nanofibers
Nanotubes
(carbon, elec. conductive filler; in electrode
catalyst layer containing aromatic polymer and conductive
filler for polymer-electrolyte fuel
cell)
- IT Fullerenes
RL: DEV (Device component use); MOA (Modifier or additive use);
USES (Uses)
(elec. conductive filler; in electrode catalyst
layer containing aromatic polymer and conductive filler for
polymer-electrolyte fuel
cell)
- IT Polysulfones, uses

10/714,394-267960-EIC 1700 SEARCH

- RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyether-polyketone-, fluorine-containing; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT Fluoropolymers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyether-polyketone-polysulfone-, in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyether-polysulfone-, fluorine-containing; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT Polyethers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyketone-polysulfone-, fluorine-containing; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT Ionic conductors
(porous aromatic polymers; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT Fuel cell electrodes
(porous electrode catalyst layers in; electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(catalyst, carried on carbon particles; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(particles, carrying platinum catalyst; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT 897014-65-2DP, 2,2-Bis(4-hydroxyphenyl)hexafluoropropane-4,4'-dichlorobenzophenone-4,4'-dichlorodiphenylsulfone-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, hydrolyzed
RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
(porous layer; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)
- IT 911123-33-6P, 2,2-Bis(4-hydroxyphenyl)hexafluoropropane-4,4'-dichlorobenzophenone-4,4'-dichlorodiphenylsulfone copolymer
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(preparation and reaction of; in electrode catalyst layer containing aromatic polymer and conductive filler for polymer-electrolyte fuel cell)

10/714,394-267960-EIC 1700 SEARCH

cell)
 IT 409-21-2, Silicon carbide (SiC), uses
 RL: DEV (Device component use); MOA (Modifier or additive use);
 USES (Uses)
 (whiskers, carbon-coated, conductive filler; in
 electrode catalyst layer containing aromatic polymer
 and conductive filler for polymer-electrolyte
 fuel cell)

L51 ANSWER 17 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2006:1066080 HCAPLUS Full-text
 DOCUMENT NUMBER: 145:400984
 TITLE: Porous electrode catalyst
 layers for membrane-
 electrode assemblies (MEA) of
 polymer-electrolyte
 fuel cells, and their
 manufacture
 INVENTOR(S): Kawai, Junji; Goto, Kohei; Fukuda, Kaoru;
 Takahashi, Ryoichiro; Shinkai, Hiroshi
 PATENT ASSIGNEE(S): JSR Ltd., Japan; Honda Motor Co., Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006278232	A	20061012	JP 2005-98248	2005 0330

PRIORITY APPLN. INFO.: JP 2005-98248
 2005
 0330

ED Entered STN: 13 Oct 2006

AB The catalyst layers contain catalysts-carrying carbon particles and aromatic polymers bearing ionic conductive components, and have pore volume of 0.1-3.0 mL/g. Preferable structure of the polymers are also given. In manufacture of the catalyst layers, pastes containing the carbon particles, the aromatic polymers, and casting solvents are cast on substrates to form thin films which are then brought in contact with solns. containing poor solvents showing compatibility with the casting solvents so as to remove the casting solvents and simultaneously form pores. The catalyst layers show good balance between gas-diffusion or water-discharging characteristics, and electron/proton conductivity

IT 908342-30-3DE, 1,3-Bis(4-chlorobenzoyl)benzene-2,2-bis(4-hydroxyphenyl)hexafluoropropane-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, hydrolyzed
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
 (porous layer; manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)

RN 908342-30-3 HCAPLUS

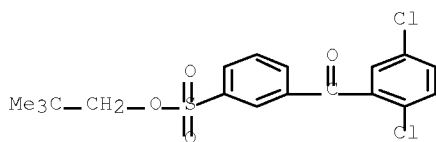
CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with 1,1'-(1,3-phenylene)bis[1-(4-chlorophenyl)methanone] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

CRN 847972-43-4

10/714,394-267960-EIC 1700 SEARCH

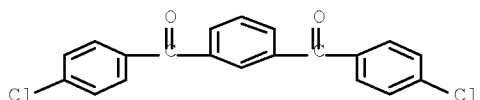
CMF C18 H18 Cl2 O4 S



CM 2

CRN 22198-44-3

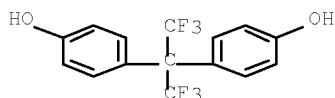
CMF C20 H12 Cl2 O2



CM 3

CRN 1478-61-1

CMF C15 H10 F6 O2



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
- ST fuel cell MEA electrode porous arom
polymer solvent casting; solvent casting porous arom polymer
electrode manuf fuel cell;
ionic conductor porous arom polymer fuel
cell electrode; sulfo polyether polyketone
porous electrode catalyst layer fuel
cell
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); PEP
(Physical, engineering or chemical process); PYP (Physical
process); PREP (Preparation); PROC (Process); USES (Uses)
(polyether-, fluorine-containing, sulfo-containing, porous
layer; manufacture of porous electrode catalyst
layer containing aromatic polymer for MEA of polymer
-electrolyte fuel cell)
- IT Fluoropolymers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PEP
(Physical, engineering or chemical process); PYP (Physical
process); PREP (Preparation); PROC (Process); USES (Uses)
(polyether-polyketone-, sulfo-containing, porous layer;
manufacture of porous electrode catalyst layer

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- containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT Polyethers, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
 (polyketone-, fluorine-containing, sulfo-containing, porous layer; manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT Ionic conductors
 (porous aromatic polymers; manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT Fuel cell electrodes
 (porous electrode catalyst layers in; porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT Casting of polymeric materials
 (solvent; porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT 872-50-4, N-Methylpyrrolidone, uses
 RL: NUU (Other use, unclassified); REM (Removal or disposal); PROC (Process); USES (Uses)
 (casting solvent; in manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT 7440-06-4, Platinum, uses
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (catalyst, carried on carbon particles; manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (particles, carrying platinum catalyst; manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT 108-88-3, Toluene, uses 123-86-4, n-Butyl acetate
 RL: NUU (Other use, unclassified); USES (Uses)
 (poor solvent for removing casting solvent; in manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT 908342-30-3DP, 1,3-Bis(4-chlorobenzoyl)benzene-2,2-bis(4-hydroxyphenyl)hexafluoropropane-neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate copolymer, hydrolyzed
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
 (porous layer; manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)
- IT 125776-08-1P 908342-29-0P, 1,3-Bis(4-chlorobenzoyl)benzene-2,2-bis(4-hydroxyphenyl)hexafluoropropane copolymer
 RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
 (preparation and reaction of; in manufacture of porous electrode catalyst layer containing aromatic polymer for MEA of polymer-electrolyte fuel cell)

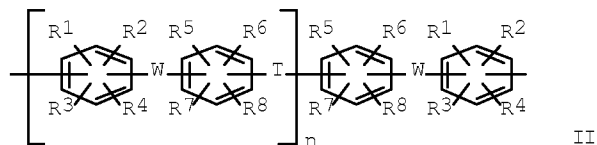
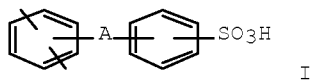
10/714,394-267960-EIC 1700 SEARCH

cell)

L51 ANSWER 18 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:402980 HCAPLUS Full-text
 DOCUMENT NUMBER: 140:409627
 TITLE: Electrode structure for
 polymer electrolyte
 fuel cells
 INVENTOR(S): Sohma, Hiroshi; Iguchi, Masaru; Kanaoka,
 Nagayuyki; Kaji, Hayato; Morikawa, Hiroshi;
 Mitsuta, Naoki
 PATENT ASSIGNEE(S): Honda Motor Co., Ltd., Japan
 SOURCE: Eur. Pat. Appl., 26 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1420473	A1	20040519	EP 2003-26194	2003 1117
EP 1420473	B1	20060412		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
US 20040197632	A1	20041007	US 2003-714394	2003 1117
JP 2005158265	A	20050616	JP 2003-387362	2003 1118
PRIORITY APPLN. INFO.:			JP 2002-333143	A 2002 1118
			JP 2003-371047	A 2003 1030

ED Entered STN: 19 May 2004
 GI



AB The present invention provides an electrode structure for polymer electrolyte fuel

10/714,394-267960-EIC 1700 SEARCH

cells, inexpensive, and exhibiting excellent power production capacity and durability even under high temperature/low humidity conditions, and also provides a polymer electrolyte fuel cell which incorporates the same electrode structure. The present invention also provides an elec. device and transportation device, each incorporating the same polymer electrolyte fuel cell. The electrode structure comprises a pair of electrode catalyst layers, each containing a catalyst supported by carbon particles, and polymer electrolyte membrane placed between these electrode catalyst layers. The polymer electrolyte membrane is of a sulfonated polyarylene composed of 0.5 to 100% by mol of the first repeating unit represented by (I) and 0 to 99.5% by mol of the second repeating unit represented by (II): (wherein, A is a divalent organic group; and a benzene ring includes its derivative; -W- is a divalent electron attracting group; - T- is a divalent organic group; and R1 to R8 are a hydrogen atom or fluorine atom, an alkyl group, fluorine-substituted alkyl group, allyl group, aryl group or cyano group, and may be the same or different).

IT 690247-89-3D, ester hydrolysis products

RL: DEV (Device component use); USES (Uses)
(electrode structure for polymer electrolyte fuel cells)

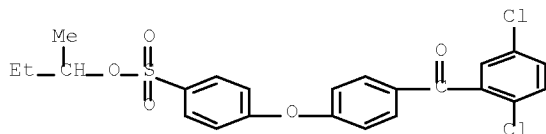
RN 690247-89-3 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 1-methylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 690247-88-2

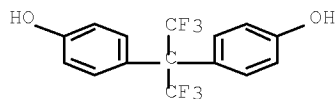
CMF C23 H20 Cl2 O5 S



CM 2

CRN 1478-61-1

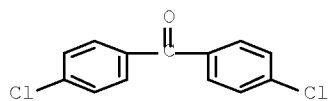
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O

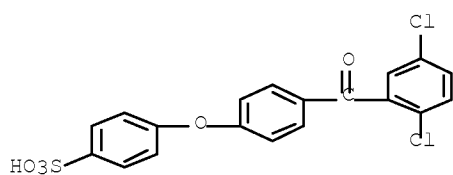


IT 663920-23-8P, Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt 690247-88-2P
690247-89-3P

RL: SPN (Synthetic preparation); PREP (Preparation)
(electrode structure for polymer
electrolyte fuel cells)

RN 663920-23-8 HCAPLUS

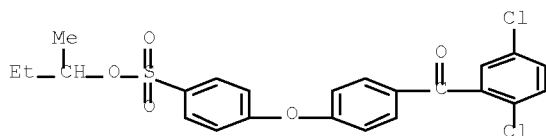
CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium
salt (1:1) (CA INDEX NAME)



● Na

RN 690247-88-2 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-,
1-methylpropyl ester (CA INDEX NAME)



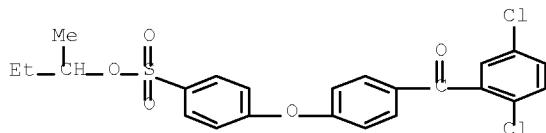
RN 690247-89-3 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-,
1-methylpropyl ester, polymer with bis(4-chlorophenyl)methanone
and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol
], block (9CI) (CA INDEX NAME)

CM 1

CRN 690247-88-2

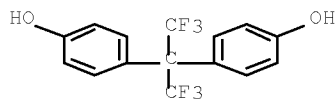
CMF C23 H20 Cl2 O5 S



CM 2

CRN 1478-61-1

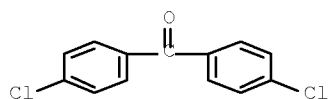
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



IC ICM H01M008-10
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST electrode structure polymer
 electrolyte fuel cell
 IT Catalysts
 (electrocatalysts; electrode structure for
 polymer electrolyte fuel
 cells)
 IT Fuel cell electrodes
 (electrode structure for polymer
 electrolyte fuel cells)
 IT Noble metals
 RL: CAT (Catalyst use); USES (Uses)
 (electrode structure for polymer
 electrolyte fuel cells)
 IT Fluoropolymers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrode structure for polymer
 electrolyte fuel cells)
 IT Polyoxyalkylenes, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (fluorine- and sulfo-containing, ionomers; electrode
 structure for polymer electrolyte
 fuel cells)
 IT Fluoropolymers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers; electrode
 structure for polymer electrolyte
 fuel cells)
 IT Ionomers
 RL: MOA (Modifier or additive use); USES (Uses)
 (polyoxyalkylenes, Fluorine- and

10/714,394-267960-EIC 1700 SEARCH

sulfo-containing; electrode structure
for polymer electrolyte fuel
cells)

- IT Fuel cells
(solid electrolyte; electrode
structure for polymer electrolyte
fuel cells)
- IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(electrode structure for polymer
electrolyte fuel cells)
- IT 690247-89-3D, ester hydrolysis products
RL: DEV (Device component use); USES (Uses)
(electrode structure for polymer
electrolyte fuel cells)
- IT 9002-84-0, Ptfе
RL: MOA (Modifier or additive use); USES (Uses)
(electrode structure for polymer
electrolyte fuel cells)
- IT 122325-09-1P 663920-23-8P, Benzenesulfonic acid,
4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt 663920-24-9P,
4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzenesulfonyl chloride
690247-88-2P 690247-89-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(electrode structure for polymer
electrolyte fuel cells)
- IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(support; electrode structure for polymer
electrolyte fuel cells)

10/714,394-267960-EIC 1700 SEARCH

FULL SEARCH HISTORY

=> d his nofile

(FILE 'HOME' ENTERED AT 09:48:22 ON 13 AUG 2008)

FILE 'HCAPLUS' ENTERED AT 09:48:54 ON 13 AUG 2008

L1 1 SEA ABB=ON PLU=ON US20040197632/PN
D ALL
SEL RN

FILE 'REGISTRY' ENTERED AT 09:51:42 ON 13 AUG 2008

L2 8 SEA ABB=ON PLU=ON (690247-89-3/BI OR 122325-09-1/BI
OR 663920-23-8/BI OR 663920-24-9/BI OR 690247-88-2/BI
OR 7440-06-4/BI OR 7440-44-0/BI OR 9002-84-0/BI)
D SCAN
D SAV

FILE 'LREGISTRY' ENTERED AT 09:52:28 ON 13 AUG 2008

L3 STR

FILE 'REGISTRY' ENTERED AT 10:00:42 ON 13 AUG 2008

L4 50 SEA SSS SAM L3
D 1-2 STR RSD
E 2 46.150/RID
E 46.150/RID
E 46.150/RID 25

FILE 'STNGUIDE' ENTERED AT 10:02:49 ON 13 AUG 2008

FILE 'HCAPLUS' ENTERED AT 10:03:50 ON 13 AUG 2008

E ELECTRON DONOR/CT
E ELECTRON ATTRACT/CT
E ELECTRON ACCEPTORS/CT
E E3+ALL
L5 94214 SEA ABB=ON PLU=ON "ELECTRON ACCEPTORS"+MAX/CT

FILE 'REGISTRY' ENTERED AT 10:07:07 ON 13 AUG 2008

FILE 'STNGUIDE' ENTERED AT 10:11:46 ON 13 AUG 2008

FILE 'LREGISTRY' ENTERED AT 10:16:04 ON 13 AUG 2008

L6 STR L3

FILE 'REGISTRY' ENTERED AT 10:18:24 ON 13 AUG 2008

L7 50 SEA SSS SAM L6
L8 16298 SEA SSS FUL L6
SAV TEMP L8 WEI394REG/A
L9 3 SEA ABB=ON PLU=ON L2 AND L8
D SCAN

FILE 'LREGISTRY' ENTERED AT 10:19:40 ON 13 AUG 2008

L10 STR L6
L11 STR L10

FILE 'REGISTRY' ENTERED AT 10:35:11 ON 13 AUG 2008

D SCAN L9
L12 50 SEA SUB=L8 SSS SAM L11
L13 3230 SEA SUB=L8 SSS FUL L11
SAV TEMP L13 WEI394REGA/A
L14 3 SEA ABB=ON PLU=ON L2 AND L13
D SCAN

FILE 'LREGISTRY' ENTERED AT 10:37:41 ON 13 AUG 2008

D QUE
L15 STR L11

10/714,394-267960-EIC 1700 SEARCH

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L16          STR L15

FILE 'REGISTRY' ENTERED AT 10:40:28 ON 13 AUG 2008
L17          12 SEA SUB=L8 SSS SAM L15 AND L16
L18          153 SEA SUB=L8 SSS FUL L15 AND L16
L19          1 SEA ABB=ON PLU=ON L18 AND L2
              D SCAN

FILE 'HCAPLUS' ENTERED AT 10:42:12 ON 13 AUG 2008
L20          157 SEA ABB=ON PLU=ON L18
L21          1 SEA ABB=ON PLU=ON L19
              D SCAN
L22          2828 SEA ABB=ON PLU=ON L13
L23          0 SEA ABB=ON PLU=ON L22 AND L5
L24          10543 SEA ABB=ON PLU=ON L8
L25          13 SEA ABB=ON PLU=ON L8 AND L5
              D 1-13 TI CC
              D SCAN L1
L26          174487 SEA ABB=ON PLU=ON "FUEL CELLS"+MAX/CT
L27          89664 SEA ABB=ON PLU=ON FUEL(2A)CELL?
L28          197224 SEA ABB=ON PLU=ON L26 OR L27
L29          127 SEA ABB=ON PLU=ON L20 AND L28
L30          565 SEA ABB=ON PLU=ON L22 AND L28
L31          565 SEA ABB=ON PLU=ON L29 OR L30
L32          31323 SEA ABB=ON PLU=ON ?POLYM?(3A)ELECTROLYT?
L33          331 SEA ABB=ON PLU=ON L31 AND L32
L34          QUE ABB=ON PLU=ON MEMBRANE
L35          297 SEA ABB=ON PLU=ON L33 AND L34
L36          54625 SEA ABB=ON PLU=ON ION?(2A)CONDUCT?
L37          131 SEA ABB=ON PLU=ON L35 AND L36
              D SCAN L1
              E IONOMERS/CT
L38          267283 SEA ABB=ON PLU=ON IONOMERS+MAX/CT
L39          257 SEA ABB=ON PLU=ON L35 AND L38
L40          275 SEA ABB=ON PLU=ON L37 OR L39
L41          QUE ABB=ON PLU=ON CATALYST?
L42          QUE ABB=ON PLU=ON CATALYSTS+MAX/CT

FILE 'REGISTRY' ENTERED AT 10:53:45 ON 13 AUG 2008
L43          1 SEA ABB=ON PLU=ON 7440-44-0/RN

FILE 'HCAPLUS' ENTERED AT 10:53:54 ON 13 AUG 2008
L44          QUE ABB=ON PLU=ON L43 OR CARBON
L45          44912 SEA ABB=ON PLU=ON L44(3A)L41
L46          36069 SEA ABB=ON PLU=ON L44(L)L42
L47          21 SEA ABB=ON PLU=ON L40 AND (L45 OR L46)
L48          QUE ABB=ON PLU=ON ELECTROD? OR CATHOD? OR ANOD? OR
              (NEGATIVE OR POSITIVE) (2A)ELECTROD?
L49          20 SEA ABB=ON PLU=ON L47 AND L48
L50          QUE ABB=ON PLU=ON FILM? OR THINFILM? OR LAYER? OR
              OVERLAY? OR OVERLAID? OR LAMIN? OR LAMEL? OR MULTILAYER
              ? OR SHEET? OR LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR
              OVERCOAT? OR VENEER? OR SHEATH? OR COVER? OR ENVELOP?
              OR ENCASE? OR ENWRAP? OR OVERSPREAD? OR ENCAPSUL?
L51          18 SEA ABB=ON PLU=ON L49 AND L50
              D SCAN L1
              SAV TEMP L51 WEI394HCP/A
              D QUE L51
              D L51 1-18 IBIB ED ABS HITSTR HITIND

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